Document #6

Standard for Friction Ridge Impression Digital Imaging (Latent/Tenprint)

1. Preamble

These standards shall be applied to the digital recording and depiction of friction ridge impressions that are to be used for examination purposes. These standards do not extend to image requirements for automated fingerprint identification systems (AFIS). Policies and procedures must be in place for the digital capture, storage, retrieval, display, and transmission of friction ridge impression images retained as evidence. This standard establishes requirements for the preservation of identity, authenticity, integrity, and security of friction ridge digital images. Prior to conducting digital imaging tasks in friction ridge examination cases, examiners shall have completed training appropriate to each task before them.

2. Policies

Agencies shall establish policies to determine which friction ridge impression digital images will be retained as evidence.

3. Image Documentation

3.1. Friction ridge impression digital images, documentation, or associated data shall be documented by one or more of the following methods:

3.1.1. A unique case identifier. This association may be accomplished by one or more of the following methods:

3.1.1.1. As part of the digital image

3.1.1.2. As part of the file name

3.1.1.3. As data associated with a digital image within an imaging database

3.1.1.4. As data associated within a standardized record (i.e., ANSI NIST Record Level 2)

3.2. Documentation shall include the following:

3.2.1. A unique case identifier

3.2.2. Date and initials or personal marking

3.2.3. Description or identifier of the item bearing the friction ridge impression

3.2.4. Information about the orientation or position of the friction ridge impression on the object through description, diagram(s), or photograph(s)

3.2.5. Scene location or address, if other than the laboratory

3.2.6. Accurate scale information

3.2.7. Make and model of the capture device

4. Image Quality

4.1. Friction ridge impressions to be used for comparison purposes should be captured (color or grayscale) at a resolution no less than 1000 ppi for latent print impressions and tenprint impressions shall be captured at a resolution no less than 500 ppi when the images are sized 1:1. Justification for any deviation from these recommended minimum criteria shall be documented on a case-by-case basis (e.g., the only available image was captured at less than 1000 ppi). Images captured at these resolutions should not be downsampled (i.e., from 1000 ppi to 500 ppi). Interpolation from a lower resolution up to a higher resolution does not meet this requirement. A list of certified scanners capable of 500 or 1000 ppi resolution is available at www.fbibiospecs.org.

4.2. In order to consistently and reliably capture images at the required resolution, digital scanners and digital cameras shall be tested in at least one configuration commonly used by the agency. It is recommended that this procedure be repeated on a regular basis, at least annually, in accordance with agency quality assurance and quality control guidelines.

4.3. If the camera has been repaired, it is recommended the camera be re-tested prior to use. If the scanner is relocated or has been repaired, it is recommended the scanner be re-tested prior to use. Corrections shall be documented.

4.4. Details for testing 1000 ppi resolution are available in the *SWGIT Procedure for Testing Scanner Resolution for Latent Print Imaging* and the *Procedure for Testing Digital Camera System Resolution for Latent Print Photography documents* [2] [3]. This testing procedure should be repeated for combinations of lens, filter, and configuration settings used in casework.

4.5. Grayscale digital imaging shall be at a minimum of 8 bits. Color digital imaging shall be at a minimum of 24 bits.

4.6. Friction ridge impression digital images to be used for comparison purposes shall be stored and transmitted without compression or with lossless compression. Capture in a raw file format is recommended, but may not be possible in some cases, depending on the equipment [4].

5. Image Integrity

5.1. A primary image is the result of the first recording of an image onto media. An original image is an accurate replica (pixel for pixel) of the primary image [5]. Each original image shall be stored in a manner that defines it as such, and permits authentication.

5.2. Enhancement shall only be conducted on working copies of the original image. Working copies used in forensic case examination shall be saved as a separate copy and shall not replace the original image.

5.3. Digital images captured from lifts or from conventional photographs or negatives shall not replace the lift, negative, or photograph as original images.

5.4. Agencies shall have procedures to ensure the accessibility of digital images: images may be archived in a format to ensure their accessibility and hardware and software may be archived to ensure accessibility of images [1].

6. Casework Documentation

6.1. Procedures shall be in place to ensure the accuracy and completeness of documentation.

6.2. Casework documentation shall distinguish friction ridge impression digital images from lifts or photographs.

6.3. The application of digital image processing (enhancement) techniques shall be documented. This documentation shall be sufficient to enable evaluation or replication of the digital image processing techniques.

7. References

[1] SWGIT, *Best Practices for Archiving Digital and Multimedia Evidence (DME) in the Criminal Justice System*, 6/4/07, ver. 1.0, https://www.swgit.org/documents/All%20Current%20Documents

[2] SWGIT, Section 21, Procedure for Testing Scanner Resolution for Latent Print Imaging, ver. 1.0 2012.01.12, https://www.swgit.org/documents/All%20Current%20Documents

[3] SWGIT, Section 22, Procedure for Testing Digital Camera System Resolution for Latent Print Photography, ver. 1.0 2012.01.13, https://www.swgit.org/documents/All%20Current%20Documents

[4] SWGIT, Section 19, Issues Relating to Digital Image Compression and File Formats, ver. 1.1 2011.01.15, https://www.swgit.org/documents/All%20Current%20Documents

[5] SWGIT, Section 13 “Best Practices for Maintaining the Integrity of Digital Images and Digital Video” and Section 14 “Best Practices for Image Authentication”, https://www.swgit.org/documents/All%20Current%20Documents

8. Revision Table

Version	Effective Start	Effective End	Posted	Archived	Change
1.0	08/08/01	12/23/08	08/08/01	12/23/08	Original Issue
1.0	12/23/08	09/14/09	12/23/08	12/21/09	Major rewrite
1.1 Draft For Comment	N/A	N/A	04/21/12	03/13/13	1. Updated Section 3.1 2. Added Sections 3.1.1, 3.1.2, 3.1.3
2.0	03/13/13	N/A	04/27/13	N/A	1. Revised numbering 2. Preamble, Sections 2, 3.1, 3.2, 4.1, 4.3, 4.4, 4.6, 5.1 modified Reformatted (start of new version number)