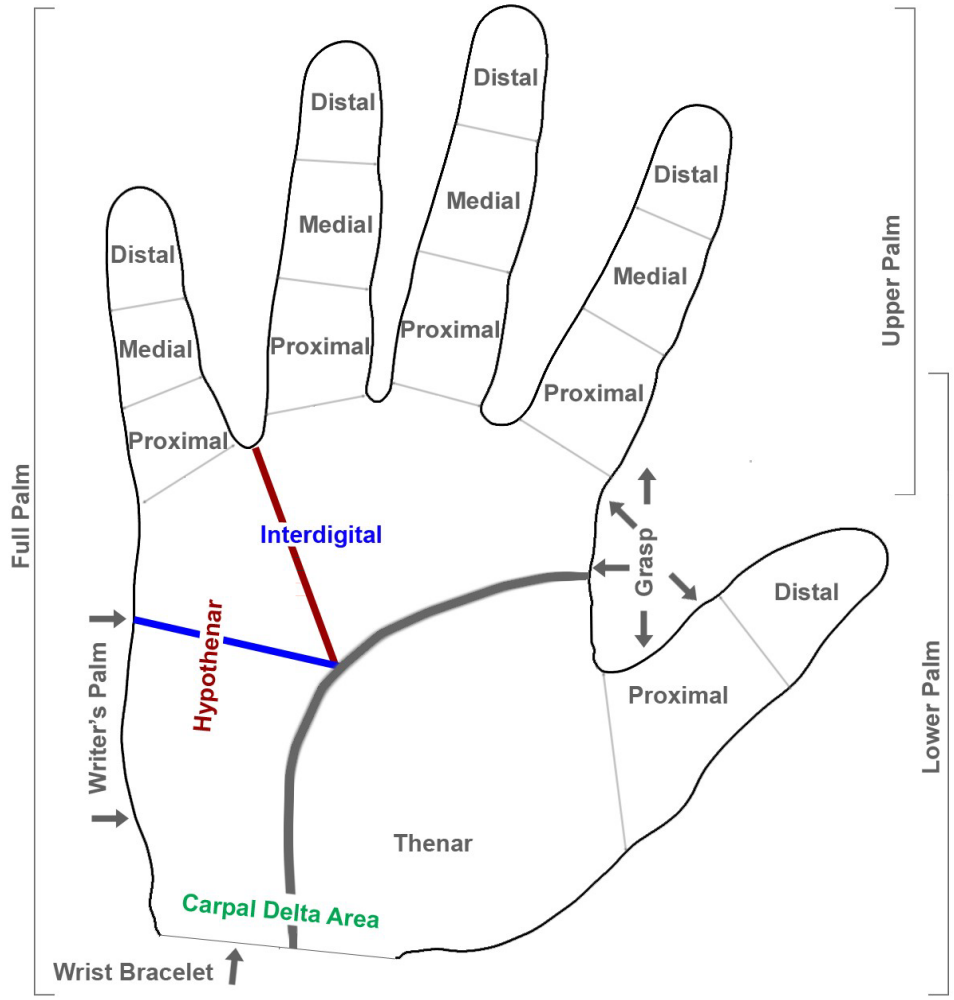
A Practical Guide for Palm Print Capture - Document Overview

The FBI's Next Generation Identification (NGI) has deployed a new National Palm Print System (NPPS). The NPPS will facilitate the storage and search of both known and unknown palm prints and will also enable users to compare latent palm prints left at crime scenes against this centralized national repository. In order to ensure the NPPS has a gallery of high quality known palm prints, the NGIPO has developed this guide to enhance user understanding of the palm anatomy and to provide a practical look at best practices for their capture, based on what works best with the new NGI matching algorithms. Included at the end of this document are two quick reference guides to provide examples of what correctly captured palm print image submissions should look like.

Parts of the Palm

The entire area of the full palm (See Figure 1) is defined as that area extending from the top of the *wrist bracelet* to the tips of the fingers and can be represented as one or two scanned images. If two images are used to represent the full palm, the lower image shall extend from the top of the *wrist bracelet* to the top of the *interdigital* area (*proximal* finger joint) and shall include the *thenar* and *hypothenar* areas of the palm. The upper image shall extend from the bottom of the *interdigital* area to the upper tips of the fingers. This provides an adequate amount of overlap between the two images to facilitate subject verification. By matching the ridge structure and details contained in the common *interdigital* area, an examiner can confidently state that both images came from the same palm. The inclusion of the finger impressions, particularly the distal segments, allows the palm print to be verified against a tenprint record for confirmation of identity.

Figure 1 - Finger and Palm Segment Positions



Palm Print Submission

The Electronic Biometric Transmission Specification (EBTS) Type-15 record shall contain and be used to exchange palm print image data. The image data shall be acquired directly from a subject using a live-scan device, a palm print card, or other media that contains the subject's palm prints.

Any method used to acquire the palm print images shall be capable of capturing a set of images for each hand. This set may include the writer's palm as a single scanned image, and the entire area of the full palm extending from the top of the wrist bracelet to the tips of the fingers as one or two scanned images.

The scanning resolution is not specified for Type-15 Records, but it is strongly recommended that the class resolution be 39.37 ppmm (1000 ppi). However, in all cases the scanning resolution used to capture the palm print image shall be either as great as the minimum scanning resolution of 19.69 ppmm (500 ppi), or 39.37 ppmm (1000 ppi).

Palm Print Image Sets

Tenprint Identification submissions may include palm print images. When submitting to the FBI, best practices for this collection of prints are defined as the equivalent of one FBI Standard Fingerprint Card FD-249 or FD-258 and two FBI Standard Palm Print Cards FD-884 per subject. While the FBI CJIS Division no longer routinely accepts hard-copy biometric submissions, the standard card equivalents are noted here for users that continue to use the FBI standard cards to support capture/scanning within their individual programs. It is important to note that the friction ridge collected on FBI cards/any card has to be rotated during scanning to a North/South position. Example: If the writer's palm is collected sideways on the card and it is scanned "as is", NGI will receive a sideways writer's edge. Please ensure to rotate friction ridge (as applicable) to a North/South position during the scanning process before forwarding to the NGI NPPS.

Palm Print Capture and Submission Best Practices

"Best Practice" for submitting palm prints in the Type-15 record will include either:

> Left and right full palm prints with the corresponding left and right writer's palms, for a total of four Type-15 Records (See *4 Image Type-15 Submission Guide*),
>
> or
>
> An upper and lower palm from each hand with the corresponding left and right writer's palms, for a total of six Type-15 Records (See *6 Image Type-15 Submission Guide*).

In capturing palm prints, accuracy is affected by incorrect image orientation. Live capture palm images should be captured as closely as possible to an upright, vertical position (See ***4 Image Type-15 Submission Guide*** and ***6 Image Type-15 Submission Guide***).

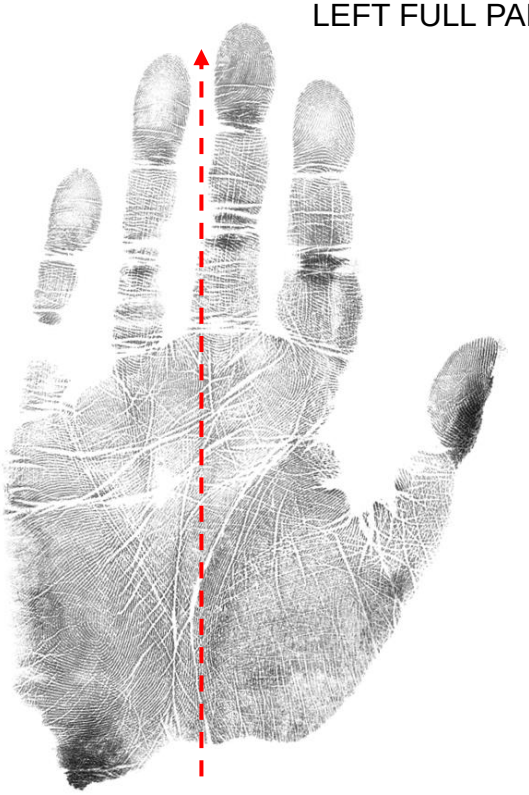
In addition, when submitting palm prints, the submission can also include rolled thenar and hypothenar from each hand, each requiring a separate Type-15 Record. The expectation with the receipt of known-subject palm prints is that the submitting agency has verified the palm print against the subject's corresponding fingerprints. In addition, the NGI system will also perform an automated validation of the submitted palm print's distal images against the composite tenprint. If the palm print orientation is not correct, the NGI system will not be able to perform this validation and the palm print images will be rejected. Plain impressions and / or identification flat impressions should never be submitted as upper palm images.

The practice of "stitching" together images that were not captured simultaneously is **prohibited**. Individual images with the proper position code should be transmitted by the contributor. For example, if the upper and lower palms are captured separately, they should be submitted as individual images using position codes 25 and 26 for the right hand or position codes 27 and 28 for the left hand. Under no circumstances should upper and lower palm images be stitched together and submitted as full palm impressions (position code 21 or 23), as the geometric relationship between minutiae is altered within the stitched image, which affects matching accuracy.

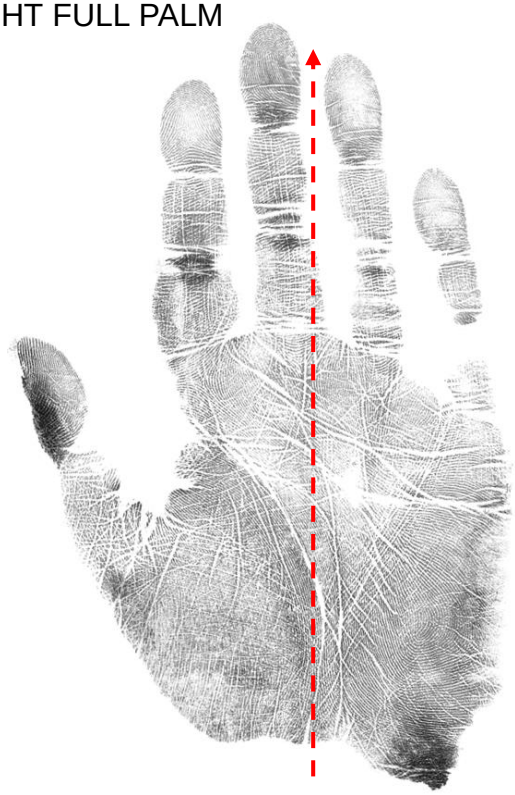
4 IMAGE TYPE-15 SUBMISSION GUIDE

Palm Print images should be captured as closely as possible to an upright, vertical position.

LEFT FULL PALM

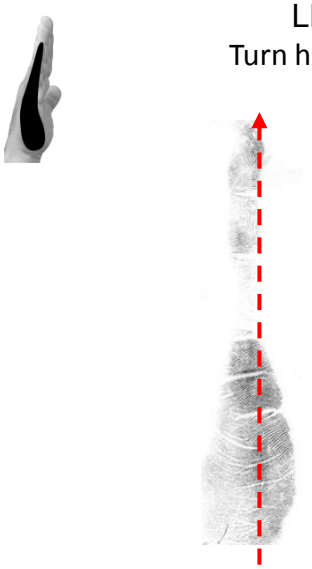


RIGHT FULL PALM



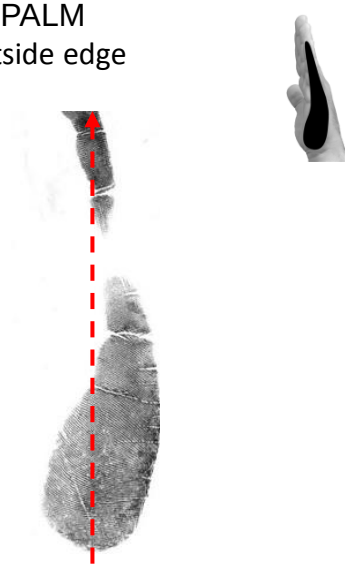
LEFT WRITER'S PALM

Turn hand 90° on outside edge



RIGHT WRITER'S PALM

Turn hand 90° on outside edge



NGI NATIONAL PALM PRINT SYSTEM (NPPS)

Provided by the FBI Criminal Justice Information Services (CJIS) Division, 1000 Custer Hollow Rd., Clarksburg, WV 26306

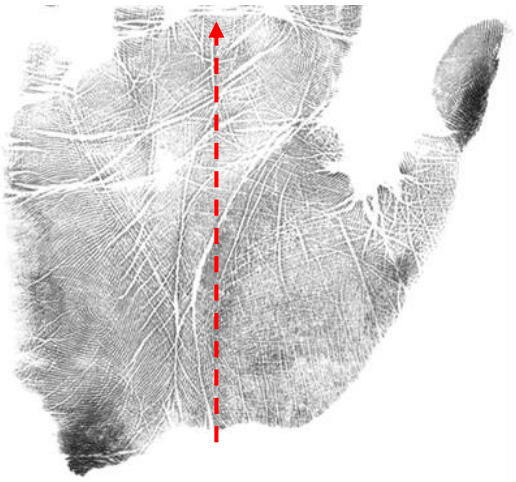
6 IMAGE TYPE-15 SUBMISSION GUIDE

Palm Print images should be captured as closely as possible to an upright, vertical position.

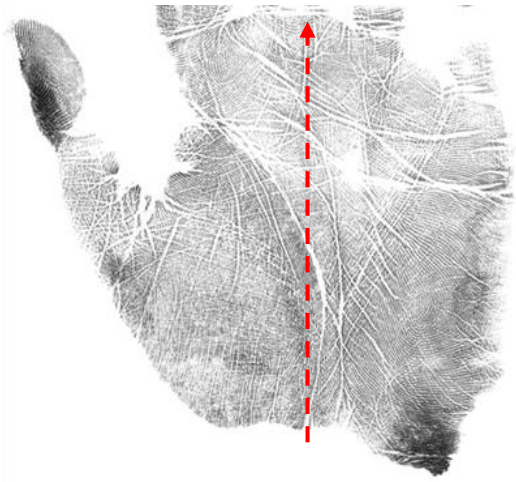
LEFT UPPER PALM

RIGHT UPPER PALM

LEFT LOWER PALM



RIGHT LOWER PALM

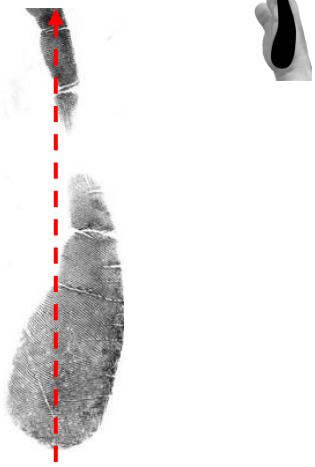


LEFT WRITER'S PALM

Turn hand 90° on outside edge

RIGHT WRITER'S PALM

Turn hand 90° on outside edge



NGI NATIONAL PALM PRINT SYSTEM (NPPS)

Provided by the FBI Criminal Justice Information Services (CJIS) Division, 1000 Custer Hollow Rd., Clarksburg, WV 26306