



December 5, 2016

ELECTRONIC BIOMETRIC TRANSMISSION

SPECIFICATION (EBTS)

TECHNICAL AND OPERATIONAL UPDATE (TOU)

10.0.7 REDLINES

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SECTION 1 – MESSAGE TO CJIS SYSTEMS OFFICERS

Technical and Operational Updates (TOUs) document functional changes to the Electronic Biometric Transmission Specification (EBTS) as an interim solution (until the release of the next major version) to enable FBI/CJIS system user compliance. The purpose of this document is to identify TOU 7 changes with redlines for user clarity. This and all previous TOUs are documented within the full text of the EBTS version 10.0.7, identified through configuration management number NGI-DOC-01862-1.0.

Please note that the functional changes documented by this TOU are cumulative such that user compliance requires adherence to the most recent version of the EBTS and incorporation of all functional changes documented by this and all prior TOUs since the release of the most recent major version of the EBTS. A comprehensive list of all TOU functional changes since the release of the most recent major version of the EBTS is located in Section 3 and sorted by section.

* * * * *

Users are reminded that any questions concerning the distribution of EBTS TOUs should be directed to the Biometric Center of Excellence.

Archived and Active versions of the EBTS and its TOUs are available via the Internet on the FBI Biospecs Web site at <<http://www.fbibiospecs.cjis.gov>>.

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SECTION 2 – FUNCTIONAL CHANGES FOR 10.0.7

Section 2 contains information concerning the modifications constituting EBTS 10.0.7. The following table is an overview of the functional modifications for this TOU version.

| Section | Change |
|---------------------|---|
| Throughout | Grammar, punctuation, and minor style updates |
| 1.8 | Added new reference |
| 3.1.4 | Corrected ERRT name |
| 3.2.2 SRE | Corrected Table 3 reference in text |
| 3.3.1.1 IRQ | Corrected name for ERRI in third paragraph |
| 3.4.2 | Added "CMF Search?" to "ULF Flag Set?" Decision point in Search row in Figure 6 |
| 3.4.3 | Corrected ERRA transaction name |
| 3.4.6.5 ERRR | Updated first paragraph |
| 3.5 | Updated first paragraph |
| Appendix B | Corrected description for 1.012 NTR |
| Appendix C | Updated Table 17 IFS Values Table |
| Appendix D | Removed 0..1 occurrence for field 2.2067 RBDI for FANC, FAUF, FNDR, MAP, NFUE, NFUF, and NNDR |
| | Removed 0..1 occurrence of field 2.2071 RBST for CAR, CPDR, and CPNU |
| Appendix F | Added text in Section 4.10.6 that points to new reference |
| | Updated FAP 50 platen size in Table F-5 |
| | Updated Mobile ID version in References |
| | Added new document in References |
| Appendix H | Corrected sentence in second paragraph |
| Appendix L | Added ERRB to Table L-3 |
| Appendix M | Removed L0174 code from Table M-1 |
| | Added error message codes RB030 and RB031 to Table M-1 |
| Appendix O | Added South Sudan to Table O-1 |
| Appendix AC | Added acronym CMF |
| | Corrected DSPR Description |
| | Corrected EHRR Description |
| | Added ERRR |
| | Added acronym IFS |
| | Corrected IRR Description |

1.2 File Format

The first field in a traditional record (2.001 LEN) shall contain the length in bytes of the record. The second field shall contain the version number in the Type-1 record, while in other records this field contains the **image information** designation character (2.002 IDC). In Traditional Record Types conveying binary data (Type-10 through Type-99) the data field will always be the last field in the Record. The remaining traditionally encoded ASCII fields may occur in any order.

1.8 Reference Documents

- American National Standards Institute/National Institute of Standards and Technology (ANSI/NIST) – Information Technology Laboratory (ITL) 1-2011 American National Standard For Information Systems – Data Format for the Interchange of Fingerprint, Facial, and Other Biometric Information, November 2011, http://biometrics.nist.gov/cs_links/standard/AN_ANSI_1-2011_standard.pdf
- IAFIS-IC-00110(V3.1), Criminal Justice Information Services (CJIS) Wavelet Scalar Quantization (WSQ) Grayscale Fingerprint Image Compression Specification, dated October 4, 2010, provides the definitions, requirements, and guidelines for specifying the FBI/CJIS’s WSQ compression algorithm. The document specifies the class of encoders required, decoder process, and coded representations for compressed image data. Latent images are not compressed. https://www.fbibiospecs.cjis.gov/Document/Get?fileName=WSQ_Grayscale_Specification_Version_3_1_Final.pdf
- Examination of Downsampling Strategies for Converting 1000 ppi Fingerprint Imagery to 500 ppi, dated January 22, 2013, http://www.nist.gov/customcf/get_pdf.cfm?pub_id=912779
- NIST Special Publication 500-289, dated August 2013, <http://nvlpubs.nist.gov/nistpubs/specialpublications/NIST.SP.500-289.pdf>
- **Examination of the Impact of Fingerprint Spatial Area Loss on Matcher Performance in Various Mobile Identification Scenarios, March 2014, <http://nvlpubs.nist.gov/nistpubs/ir/2014/NIST.IR.7950.pdf>**

3.1.1.21 Submission Results – Electronic (SRE)

Table 2 Values of NAM, FBI Number/UCN and SID Returned in the SRE

| Type of Submission | Result | Value of Returned Field | | | Special Exceptions |
|---|----------------------|-------------------------|-----------------------|---------------|--------------------|
| | | Name | FBI Number/UCN | SID | |
| Criminal, No FBI Number/UCN Submitted | Non-Ident Non-Retain | NAM Submitted | None | Submitted SID | |
| Criminal, No FBI Number/UCN Submitted | Non-Ident Retain | NAM Submitted | Master FBI Number/UCN | Submitted SID | |
| Criminal, No FBI Number/UCN Submitted | Ident Non-Retain | Master NAM | Master FBI Number/UCN | Master SID | |
| Criminal, No FBI Number/UCN Submitted | Ident Retain | Master NAM | Master FBI Number/UCN | Master SID | |
| Criminal, FBI Number/UCN Submitted | Non-Ident Non-Retain | NAM Submitted | None | Submitted SID | STD in ERS |
| Criminal, FBI Number/UCN Submitted | Non-Ident Retain | NAM Submitted | Master FBI Number/UCN | Submitted SID | STD in ERS |
| Criminal, FBI Number/UCN Submitted | Ident Non-Retain | Master NAM | Master FBI Number/UCN | Master SID | STD in ERS |
| Criminal, FBI Number/UCN Submitted | Ident Retain | Master NAM | Master FBI Number/UCN | Master SID | STD in ERS |
| Civil, No FBI Number/UCN Submitted | Non-Ident Non-Retain | NAM Submitted | None | None | |
| Civil, No FBI Number/UCN Submitted | Non-Ident Retain | NAM Submitted | UCN | None | |
| Civil, No FBI Number/UCN Submitted | Ident Non-Retain | Master NAM | Master FBI Number/UCN | Master SID | |
| Civil, No FBI Number/UCN Submitted | Ident Retain | Master NAM | Master FBI Number/UCN | Master SID | |
| Civil, FBI Number/UCN Submitted | Non-Ident Non-Retain | NAM Submitted | None | None | STD in ERS |
| Civil, FBI Number/UCN Submitted | Non-Ident Retain | NAM Submitted | UCN | None | STD in ERS |
| Civil, FBI Number/UCN Submitted | Ident Non-Retain | Master NAM | Master FBI Number/UCN | Master SID | STD in ERS |
| Civil, FBI Number/UCN Submitted | Ident Retain | Master NAM | Master FBI Number/UCN | Master SID | STD in ERS |
| Humanitarian, No FBI Number/UCN Submitted | Non-Ident | NAM Submitted | Master FBI Number/UCN | None | |
| Humanitarian, No FBI Number/UCN Submitted | Ident | Master NAM | Master FBI Number/UCN | None | |
| Humanitarian, FBI Number/UCN Submitted | Non-Ident | NAM Submitted | Master FBI Number/UCN | None | STD in ERS |
| Humanitarian, FBI Number/UCN Submitted | Ident | Master NAM | Master FBI Number/UCN | None | STD in ERS |

3.1.2 Latent Fingerprint Identification Submission

The FBI/CJIS's responses to electronic submissions will provide search results or indicate an error via the following TOTs:

| TOT | RESPONSE TRANSACTION |
|------|---|
| LSR | Latent Submission Results Electronic |
| ERRL | Latent Transaction Error |

3.1.3 Rapid Fingerprint Identification Search Submission

The Rapid Search functionality provides the ability to perform an identification search against a repository with a limited population. This results in a significantly reduced response time in comparison to Tenprint Fingerprint Identification Search response times. These Rapid Fingerprint Identification Search ~~S~~submissions are directed against the Repository for Individuals of Special Concern (RISC), which contains records for Wanted Persons, Immigration Violators, Known or Appropriately Suspected Terrorists, Sexual Offender Registry Subjects, and other persons of special interest. Rapid Search functionality has been expanded to include searching the criminal repository by authorized agencies. These transactions will initiate a cascaded search of the ULF and certain Special Population Cognizant (SPC) files after a Rapid Search response has been provided to the Authorized Contributor.

The following TOT will be accepted by the FBI/CJIS for Rapid Fingerprint Identification Search Submissions:

| TOT | TRANSACTION |
|------|---|
| RPIS | Rapid Fingerprint Identification Search Submission |

3.1.3.1 Rapid Fingerprint Identification Search ~~Submission~~ (RPIS)

3.1.4 Disposition Fingerprint Submission

The FBI/CJIS response to electronic submissions will provide search results or indicate an error via the following TOTs:

| TOT | RESPONSE TRANSACTION |
|------|---|
| SRE | Submission Results - Electronic |
| ERRT | Fingerprint Verification Error Response Tenprint Transaction Error |

3.2.2 Fingerprint Verification Response (SRE)

This transaction is returned by the FBI/CJIS in response to a Fingerprint Verification request. A Match response will be returned when the images on file for the submitted FBI Number/UCN (2.014 FBI) match the submitted images and will contain the electronic Identity History Summary (2.075 ERS), if requested. A No Match response will be returned when the images submitted do not match the images on file for the quoted UCN. Table 2.3 "Values of NAM, FBI Number/UCN and SID Returned in the SRE for FVR" describes which NAM, FBI #Number/UCN, and SID are returned in the SRE for the Fingerprint Verification request. For further information, please refer to the Identification Services section, Submission Results – Electronic (SRE) subsection.

Table 3 Values of NAM, FBI Number/UCN and SID Returned in the SRE for FVR

| Type of Submission | Result | Value of Returned Field | | | Special Exceptions |
|----------------------------------|----------|-------------------------|-----------------------|---------------|--------------------|
| | | Name | FBI Number/UCN | SID | |
| Fingerprint Verification Request | Match | Master NAM | Master FBI Number/UCN | Master SID | |
| Fingerprint Verification Request | No Match | NAM Submitted | None | Submitted SID | STD in ERS |

3.3.1 Biometric Image Retrieval Submission

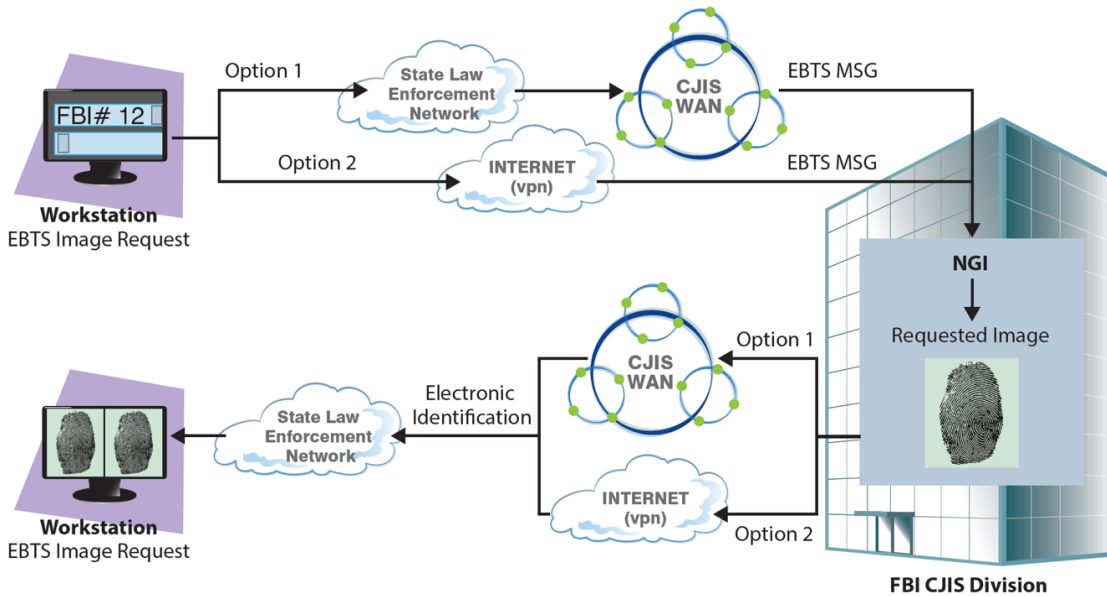


Figure 4 Biometric Image Retrieval Submission

[Unchanged text not included here for brevity]

The following TOTs are applicable only **for request** for legacy requests for Criminal Subject Photo Images:

TOT TRANSACTION
 CPR Subject Photo Request

3.3.1.1 Biometric Image/Feature Retrieval Request (IRQ)

If the request contains any invalid field values or is missing any required fields, an Information **Transaction Error Response** (ERRI) will be returned, including the reason for the return in the Status/Error Message (2.060 MSG) field. Errors associated with individual subject identifier numbers, such as an image set not being on file, will be reported in the MSG field of the Image Summary Response (ISR).

3.3.2 Biometric Audit Trail Retrieval Submission

The following are the TOTs for Biometric Audit Trail Retrieval Submission:

| TOT | TRANSACTION |
|------|--|
| BATQ | Biometric Audit Trail Retrieval Query |

3.4.1 Tenprint Fingerprint Investigation Submission

The following are the potential responses to tenprint fingerprint submissions:

| TOT | TRANSACTION |
|------|-----------------------------|
| SRT | Search Results - Tenprint |
| TRRR | Tenprint Rap Sheet Response |
| ERRT | Tenprint Transaction Error |

3.4.1.3 Search Results — Tenprint (SRT)

This transaction is returned by the FBI/CJIS in response to a TPIS request. The Search Results – Tenprint (SRT) response will include a candidate list and the fingerprint images of the highest scoring candidates who potentially match the submitted fingerprints, up to the number specified in the Number of Images Requested (2.2010 NIR) field. Up to 99 candidates may be requested by including the Number of Candidates Returned (2.079 NCR) field in the search request. If NCR is not included in the request, 20 candidates will be returned. If NIR is not specified in the search request, only images from the highest scoring candidate will be returned.

3.4.2 Latent Friction Ridge Investigation Submission

Latent Friction Ridge investigative search TOTs will accept NDR values specified in EBTS, which includes the capability to request a simultaneous search of other external systems, such as Canada's Real-Time ID System or DHS IDENT. The default behavior when the NDR field is not present is to only search the criminal repository. For a given latent investigative search, NGI will not search both known and unknown repositories. If the NDR field contains both repository designations, only the known repository will be searched, and this information will be reported in the Search Results - Latent (SRL) response (see 2.060 MSG field of SRL). Additionally, the user will be able to select in investigative searches whether features and matched minutiae for each candidate print are returned in the SRL.

[Unchanged text not included here for brevity]

The following are the potential responses to latent friction ridge transactions:

| TOT | RESPONSE TRANSACTION |
|------|--|
| SRL | Search Results - Latent |
| LPNR | Latent Penetration Query Response |
| ERRL | Latent Transaction Error |

[Unchanged text not included here for brevity]

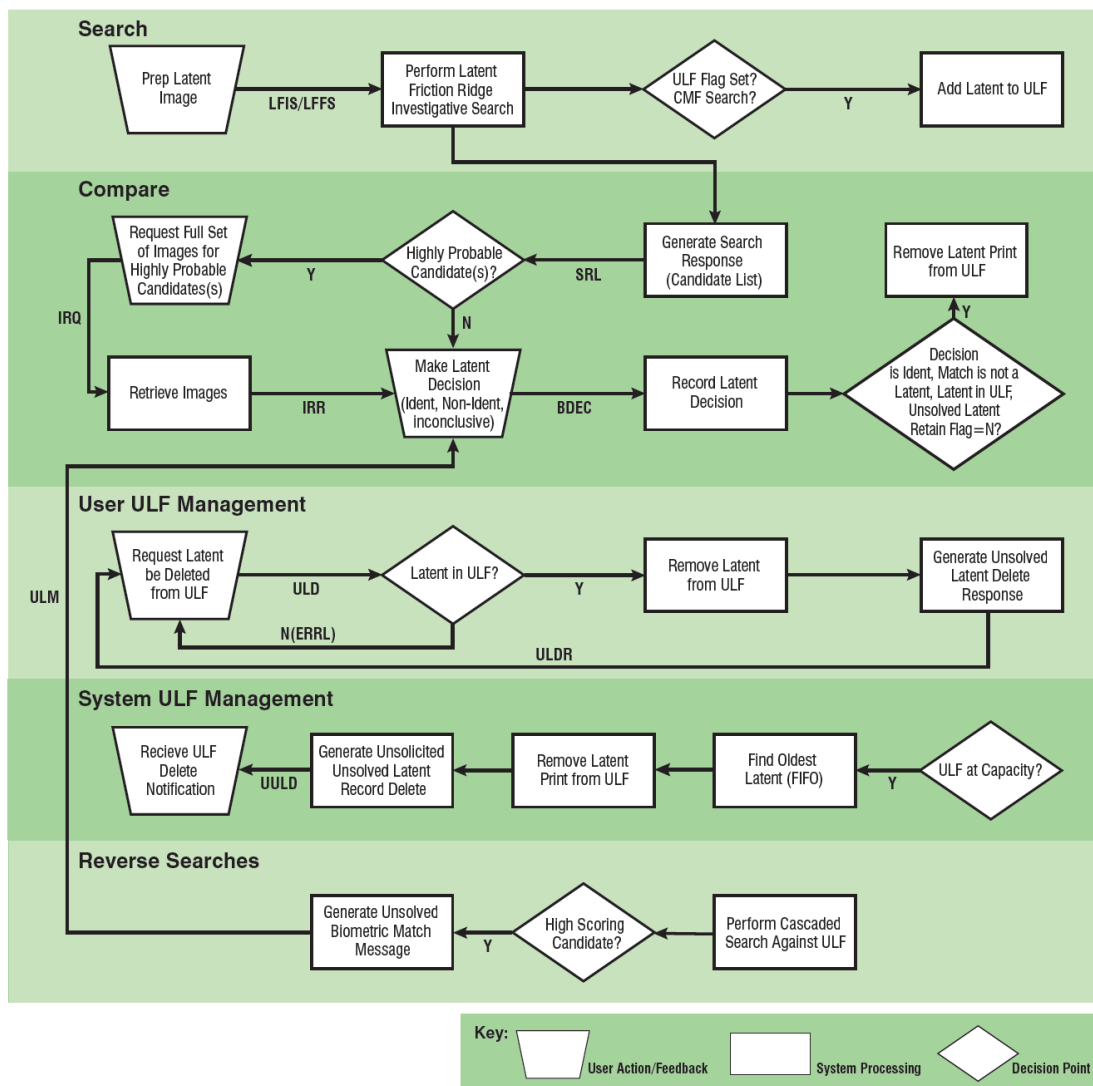


Figure 6 Latent Friction Ridge Investigation Workflow

3.4.2.1 Latent Friction Ridge Image(s) Search (LFIS)

3.4.2.3 Search Results – Latent (SRL)

The response to a Latent Friction Ridge Investigation Submission is the Search Results - Latent (SRL) response, which includes up to three ranked Candidate Investigative Lists (2.2033 CNL) - one for each friction ridge type (fingerprints, lower palm, upper palm) searched - and the friction ridge images of the highest scoring candidates who potentially match the submitted latent prints, up to the number specified in the Number of Images Requested (2.2010 NIR) field. Up to 99 candidates may be requested by including the Number of Candidates Returned (2.079 NCR) field in the search request. If NCR is not included in the request, then the top 20 candidates will be included in each ranked candidate list. If NIR is not specified in the search request the top 20 matching images will be returned per ranked candidate list. The NCR and NIR field values in the SRL may be smaller than their values in the LFIS/LFFS request (i.e., their values are not simply echoed from the search request). In addition, if the search included an indication that the

latent image should be stored in the Unsolved Latent File, the SRL will return the FBI Number/UCN (2.014 FBI) of the stored unsolved latent image.

[Unchanged text not included here for brevity]

If requested in the originating search request, features and matched minutiae for each candidate print image are returned in the SRL response. The features and matched minutiae will reside in the EFS section of the Type-9 Record(s). When features are requested, the SRL will contain biometric data for both probe and candidates. The **Image Information** Designation Character (2.2033J IDC) values for the candidate list images/features will be recorded in the CNL, while the IDC for the probe features will not. The probe features will always precede the candidate image and features in the transaction, therefore, when NIR is 20 there will be 21 Type-9 Records; the first one will present the matched minutiae of the searched image and the remaining Records will be those of the candidates returned. For multi-finger latent searches, there will be Type-9s for each probe image, distinguished by finger position. There can be up to 10 Type-9s for the probe, followed by the candidate Type-9s.

3.4.3 Latent Administrative Queries, Requests, and Responses

The following are the responses to the above transactions:

| TOT | RESPONSE TRANSACTION |
|------|--|
| LRSR | Latent Repository Statistics Response |
| ERRA | Administrative Transaction Error Response |

3.4.4.1 Photo Investigation Submission

The following are the responses to the above transactions:

| TOT | RESPONSE TRANSACTION |
|------|---------------------------------|
| SRB | Search Results - Biometric |
| ERRB | Biometric Search Error Response |

3.4.4.4 Search Results - Biometric (SRB)

This transaction is returned by FBI/CJIS in response to investigative searches that are not friction ridge based, such as FRS or TXTSRCH. The Search Results - Biometric (SRB) response includes a Candidate Investigative List (2.2033 CNL) of Subject Identifiers (2.2033A SI) up to the number specified in the Number of Candidates Returned (2.079 NCR) field of the search message. The SRB also includes corresponding number of biometric images, up to the value of the Number of Images Requested (2.2010 NIR) field presented in the request, or 20 images if NIR is omitted. If there are hits from multiple BSIs for a given SI only the top scoring BSI for a UCN is listed in the CNL and placed in score order. Therefore a UCN will only be represented once in CNL for FRS and TXTSRCH.

3.4.5 Iris Image Investigation Search Submission (Future Capability)

The FBI/CJIS response to electronic submissions will provide search results or indicate an error via the following TOTs:

| TOT | RESPONSE TRANSACTION |
|------|---------------------------------|
| SRB | Search Results - Biometric |
| ERRB | Biometric Search Error Response |

3.4.6.4 External Query History Request Response - Summary (EQRR)

An External Query **History** Request Response – **Summary** (EQRR) will be returned as a summary report of the number of candidates returned from the search and the UCN of each candidate. The number of EHRR and ERRR messages returned for the search, up to 20, will be equal to the number of candidates stated in the EQRR message.

3.4.6.5 Transaction Error (Electronic Response) (ERRR)

When the result of the External Query History Request contains candidate(s) where the Identity History Summary is not available, the Transaction Error (Electronic Response) (ERRR) will be returned to the contributor. ~~As a number of records for persons born before 1956 have not been automated, those Identity History Summaries will not be available.~~ The ERRR will include a Status/Error Message (2.060 MSG) field indicating the status of the record. ~~The record will be converted. In three to four business days, the contributor may submit a follow-on EQHR request to receive the Identity History Summary electronically.~~ If the DOB in the EQHR is omitted or invalid, an ERRR indicating the error ~~(in the Status/Error Message (2.060 MSG) field)~~ will be the only response. (See Section 3.7)

3.5 Notification Service

NGI's Notification Service provides agencies with unsolicited notifications based on triggering event criteria. An unsolicited notification may be triggered by functions initiated by the system, Authorized FBI Service Providers, or Authorized Contributors. One of the functions that may trigger these notifications is the cascaded searches from identification and investigative searches. ~~Another triggering event may be the update of an Identity History record. Since these notifications are triggered by events other than submissions, the Transaction Control Reference (1.010 TCR) field will not be populated for these messages.~~ The update of an Identity History record may also be a triggering event; since these events are not submissions, the Transaction Control Reference (1.010 TCR) field will not be populated in these cases.

3.6 Data Management Service

The following TOTs are file maintenance transactions transmitted to the FBI/CJIS:

| TOT | TRANSACTION |
|--------|--|
| RBSCRM | Rap Back Subsequent Subscription - (Criminal) |
| RBSCVL | Rap Back Subsequent Subscription - (Civil) |

3.8.3 **Fingerprint FBI/CJIS** Image Quality Specifications

The ~~IAFIS~~ **FBI/CJIS** Image Quality Specifications are provided in Appendix F.

Appendix A: Transaction Response Times**Table A-2 NGI Type of Transaction by Service**

| Service | Transaction | TOT | Description |
|-------------------------|---|------|--|
| Identification Services | Rapid Fingerprint Identification Search | RPIS | Rapid Fingerprint Identification Search Submission |

Appendix B: Descriptors and Field Edit Specifications for Type-1 Logical Records**NTR 1.012 Nominal Transmitting Resolution**

For EBTS transactions, this mandatory field shall specify the nominal transmitting resolution for fingerprint images transmitted in Type-4 or Type-7 records. This field shall contain five bytes specifying the transmitting resolution in pixels per millimeter. The resolution shall be expressed as two numeric characters followed by a decimal point and two more numeric characters (e.g., 19.69). For Type-4 records, the transmitting resolution shall be 495-505ppi (500+-1%); for Type-7 records, the transmitting resolution shall either be 495-505ppi (500+-1%) or 990-1010ppi (1000+-1%). For transactions that do not contain ~~Type-3 Type-4 through~~ or Type-7 fingerprint image records, this field shall be set to “00.00”. A single transaction can only contain multiple Type-4 and/or Type-7 records if all images have the same resolution.

Appendix C: Descriptors and Field Edit Specifications for Type-2 Logical Records**CNL 2.2033 Candidate Investigative List**

J. IDC is the ~~Image Information~~ Designation Character,

IFS 2.2021 Identification Firearms Sales

This field indicates a prohibitor that may prevent the subject from the purchase of a firearm.

Table 17 IFS Values Table

| Code | Description |
|--------------|--|
| D | Disqualification for Firearms Sales |
| X | Court Disposition Pending/Conviction Status Unknown |
| C | No Disqualification for Firearms Sales |

RBMI 2.2039 Rap Back Maintenance Indicator

This field is used in the Rap Back Maintenance Request ~~Transaction~~ (RBMNT) to indicate the type of maintenance action being requested as defined in the Rap Back Maintenance Request section of this document.

RBST 2.2071 Rap Back Subscription Term (Civil Subscriptions Only)

This field indicates the Length of the Term of a Rap Back Subscription, during which time no additional fee will be charged for the Subscriber to validate their authority to subscribe to the individual and “extend” the subscription. Available Subscription Terms are 2, 5, or Lifetime. Values for this field must be chosen from the table below.

ULR 2.2034 Unsolved Latent Retained

This field is used in a Biometric Decision **Submission** (BDEC) when the decision is a positive identification and the user requests that the unsolved record be retained in the unsolved file. A value of ‘Y’ indicates that the latent record should be retained in the ULF. No value or a value of ‘N’ indicates that the user does not want the unsolved record retained.

Table C-1 Field Edit Specifications for Type-2 Elements

| Field Number | Identifier | Field Name | Character | Field Size | | Occurrences | |
|--------------|---------------------|----------------------------|-----------|--------------------------------------|-----|-------------|------|
| | | | | (not including Character Separators) | | Min | Max |
| | | | | Min | Max | | |
| 2.014 | FBI/ UCN | FBI Number/ UCN | AN | 1 | 9 | | 1000 |

Appendix D: Summary of Logical Record Layouts for Type-2 Identification and Verification Transactions

Table D-1 Summary of Field Lists for Identification and Verification Transactions

| Tag Element |
|---------------------------|
| 2.014 FBI/ UCN |

| Tag Element | FANC | FAUF | FNDR | MAP | NFUE | NFUF | NNDR |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 2.2067 RBDI | 0..1 | 0..1 | 0..1 | 0..1 | 0..1 | 0..1 | 0..1 |

| Tag Element | CAR | CPDR | CPNU |
|-------------|-----------------|-----------------|-----------------|
| 2.2071 RBST | 0..1 | 0..1 | 0..1 |

Appendix F: FBI/CJIS Image Quality Specifications

4.10.6 Fingerprint Quality

Requirement:

The printer shall produce sufficient print quality to allow usable viewing of life-size fingerprint prints under magnification to support fingerprint comparisons (i.e., identification or non-identification decisions). The print image shall maintain its sharpness and detail rendition structure up to at least 4X magnification to the extent that ridges and ridge joints, bifurcations, and terminations that exist in the input digital image to the printer can be substantially discerned by the human observer on the output print without being “lost in the noise.” In addition, the printing process shall not create significant false detail (e.g., it shall not create ridges where none existed in the input digital image). *See Examination of the Impact of Fingerprint*

Spatial Area Loss on Matcher Performance in Various Mobile Identification Scenarios under Appendix F References for more information.

5.0 Mobile ID

Table F-5 Mobile ID IQS Requirements

| Fingerprint Acquisition Profile (FAP) | Minimum Image Dimensions (WxH in Inches) | IOS Specification Requirements | Simultaneous # of Fingers |
|---------------------------------------|--|--------------------------------|---------------------------|
| 10 | 0.5 x 0.65 | PIV | 1 |
| 20 | 0.6 x 0.8 | PIV | 1 |
| 30 | 0.8 x 1.0 | PIV | 1 |
| 40 | 1.6 x 1.5 | PIV | 1-2 |
| 45 | 1.6 x 1.5 | App F | 1-2 |
| 50 | 2.5 x 1.5 3.2 x 2.0 | App F | 1-3 1-4 |
| 60 | 3.2 x 3.0 | App F | 1-4 |

Appendix F - References

Mobile ID Device Best Practice Recommendation and Specification v2, ~~Aug-2009~~ Nov 2015, National Institute of Standards and Technology (NIST), available at

<https://www.nist.gov/sites/default/files/documents/itl/iad/ig/MobileID-BPRS-20090825-V100.pdf>

<http://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.500-280v2.pdf>

Personal Identity Verification (PIV) Image Quality Specifications for Single Finger Capture Devices, FBI/CJIS Biometric Specifications, 10 July 2006, available at <https://www.fbibiospecs.cjis.gov/Document/Get?fileName=pivs.spec.pdf>

Test Procedures for Verifying IAFIS Image Quality Requirements for Fingerprint Scanners and Printers, v1.4, MITRE Technical Report MTR050016R7, Feb 2013.

NIST Special Publication 500-290 - Data Format for the Interchange of Fingerprint, Facial, and Other Biometric Information, January 2011, National Institute of Standards and Technology (NIST), available at http://www.nist.gov/itl/iad/ig/ansi_standard.cfm

Examination of the Impact of Fingerprint Spatial Area Loss on Matcher Performance in Various Mobile Identification Scenarios, March 2014, <http://nvlpubs.nist.gov/nistpubs/ir/2014/NIST.IR.7950.pdf>

Appendix H: Descriptors and Field Edit Specifications for Type-7 Logical Records

For EBTS transactions, Field 1.012: Nominal transmitting resolution (NTR) specifies the nominal transmitting resolution for fingerprint images transmitted in Type-4 or Type-7 records. For Type-7 records, the transmitting resolution shall either be 495-505ppi (500+-1%) or 990-1010ppi (1000+-1%). For transactions that do not contain ~~Type-3 Type-4 through~~ or Type-7 fingerprint image records, this field shall be set to "00.00". A single transaction can only contain multiple Type-4 and/or Type-7 records if all images have the same resolution.

Appendix J: Descriptors and Field Edit Specifications for Type-9 Logical Records

Appendix J provides the field specifications for submitting or receiving a Type-9 Image Feature record with a ~~h~~Latent ~~f~~Friction Ridge ~~f~~Features ~~s~~Search (LFFS) or ~~s~~Search ~~r~~Results - ~~h~~Latent (SRL) transaction respectively.

[Unchanged text not included here for brevity]

The Type-9 Data Dictionary for this appendix only includes those fields that have been constrained by NGI/CJIS functionality. All other fields defined in the ANSI/NIST-ITL will be used as defined in that standard.

~~1) Common Types~~

~~The following list of fields are those common to both the FBI IAFIS Feature Set and the Extended Feature Set. Refer to the ANSI/NIST-ITL Standard for complete definition and usage of the following fields.~~

- ~~LEN — 9.001 — Logical Record Length~~
- ~~IDC — 9.002 — Information Designation Character~~
- ~~IMP — 9.003 — Impression Type~~
- ~~FMT — 9.004 — Minutiae Format~~

~~2) 1) Extended Feature Set Fields~~

~~The following list of fields are those used by NGI in the Extended Feature Set (EFS). EFS is the preferred method of transmitting minutiae information to NGI.~~

[Unchanged text not included here for brevity]

~~3) 2) FBI IAFIS Feature Set Fields (Legacy Only)~~

~~The following list of fields represent the Legacy FBI IAFIS Feature Set. These fields are supported for backward compatibility for legacy users with LFFS searches of fingerprint (FGP 0-10) features only.~~

Appendix L: Summary Tables

Table L-1 Complete Element Cross-Reference List by Tag Number

| EBTS Tag Number | Element ID | Element Name |
|-----------------|--------------------|-------------------------------------|
| 2.014 | FBI/UCN | FBI NUMBER/UNIVERSAL CONTROL NUMBER |

Table L-2 Record Set Requirements Summary by Type of Transaction

| TRANSACTION | TOT | T1 | T2 | T4 | T7 | T9 | T10 | T13 | T14 | T15 | T17 |
|---|-----|----|----|------|-----|----|------|-----|------|------|-----|
| Identification Service Transactions | | | | | | | | | | | |
| CRIMINAL TENPRINT SUBMISSION (ANSWER REQUIRED) | CAR | 1 | 1 | 0-14 | 0-2 | 0 | 0-25 | 0 | 0-46 | 0-10 | 0-2 |

SECTION 2 – EBTS FUNCTIONAL CHANGES

| | | | | | | | | | | | |
|--|------|---|---|------|-----|---|------|---|------|------|-----|
| CRIMINAL TENPRINT SUBMISSION (NO ANSWER REQUIRED) | CNA | 1 | 1 | 0-14 | 0-2 | 0 | 0-25 | 0 | 0-46 | 0-10 | 0-2 |
| FEDERAL APPLICANT (NO CHARGE) | FANC | 1 | 1 | 0-14 | 0-2 | 0 | 0-25 | 0 | 0-46 | 0-10 | 0-2 |
| FEDERAL APPLICANT USER FEE | FAUF | 1 | 1 | 0-14 | 0-2 | 0 | 0-25 | 0 | 0-46 | 0-10 | 0-2 |
| FEDERAL NO CHARGE DIRECT ROUTE | FNDR | 1 | 1 | 0-14 | 0-2 | 0 | 0-25 | 0 | 0-46 | 0-10 | 0-2 |
| NON-FEDERAL NO CHARGE DIRECT ROUTE | NNDR | 1 | 1 | 0-14 | 0-2 | 0 | 0-25 | 0 | 0-46 | 0-10 | 0-2 |
| MISCELLANEOUS APPLICANT CIVIL | MAP | 1 | 1 | 0-14 | 0-2 | 0 | 0-25 | 0 | 0-46 | 0-10 | 0-2 |

Investigation Service Transactions

| | | | | | | | | | | | |
|---|---------|---|---|---|---|---|---|---|---|---|---|
| TEXT-BASED PHOTO/SMT SEARCH REQUEST | TXTSRCH | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|---|---------|---|---|---|---|---|---|---|---|---|---|

Table L-3 Record Set Requirements Summary by Type of Response

| TRANSACTION | TOT | T1 | T2 | T4 | T7 | T9 | T10 | T13 | T14 | T15 | T17 |
|---|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Investigative Services Responses | | | | | | | | | | | |
| LATENT PENETRATION QUERY RESPONSE | LPNR | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EXTERNAL QUERY HISTORY ERROR RESPONSE | EQER | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BIOMETRIC SEARCH ERROR | ERRB | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TRANSACTION ERROR (ELECTRONIC RESPONSE) | ERRR | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Data Management Service Responses

| | | | | | | | | | | | |
|---|------|---|---|---|---|---|---|---|---|---|---|
| BIOMETRIC IMAGE SUBMISSION RESPONSE | FISR | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|---|------|---|---|---|---|---|---|---|---|---|---|

Table L-4 Transaction/Response/Error TOT Correspondence

| Transaction | TOT | Response TOTs | Error TOTs |
|---|------|---------------|------------|
| CRIMINAL TENPRINT SUBMISSION (ANSWER REQUIRED) | CAR | SRE | ERRT |
| CRIMINAL TENPRINT SUBMISSION (NO ANSWER REQUIRED) | CNA | None | ERRT |
| FEDERAL APPLICANT (NO CHARGE) | FANC | SRE | ERRT |
| FEDERAL APPLICANT USER FEE | FAUF | SRE | ERRT |
| FEDERAL NO CHARGE DIRECT ROUTE | FNDR | SRE | ERRT |
| NON-FEDERAL NO CHARGE DIRECT ROUTE | NNDR | SRE | ERRT |
| MISCELLANEOUS APPLICANT CIVIL | MAP | SRE | ERRT |

Investigation Service Transactions

| | | | |
|--|---------------|-----|------|
| TEXT-BASED PHOTO/SMT SEARCH REQUEST | TXTSRCH .0 | SRB | ERRB |
|--|---------------|-----|------|

APPENDIX M: TRANSACTION MESSAGES

Table M-1 Transaction Messages

| Code | Condition for Message | Description | Count | Insert #1 | Insert #2 | Insert #3 |
|-------|--|---|-------|-----------|-----------|-----------|
| L0174 | Subjects first arrest record is automated, but subsequent arrests have not been. | FBI %1 NOT ON FILE. NOTICE— A LARGE NUMBER OF RECORDS FOR PERSONS BORN PRIOR TO 1956 ARE NOT AUTOMATED AT THE FBI | 4 | UCN | | |

| Code | Condition for Message | Description | Count | Insert #1 | Insert #2 | Insert #3 |
|-------|--|---|-------|---------------|---------------|-----------|
| RB030 | The Rap Back element has invalid data. | Rap Back Element %1, with value of [%2] contains invalid data. | 2 | Element Name | Element Value | |
| RB031 | The Rap Back Maintenance Request has invalid data. | The Rap Back Maintenance request contains invalid data, %1, in field %2 | 2 | Element Value | Element Name | |

Appendix O: POB Code Table

Table O-1: POB Code Table

| CODE | CTZ | DESCRIPTION | DATE AHEAD FLAG |
|------|-----|-------------------------|-----------------|
| ZE | | Kialegee Tribe Town, OK | |
| ZF | * | South Sudan | |
| ZI | * | Canary Islands | |

Appendix AC: ACRONYMS

| Acronym | Description |
|---------|---|
| CM | Central Pocket – Loop Whorl - Meeting |
| CMF | Criminal Master File |
| CNA | Criminal Tenprint Submission (No Answer Necessary) |
| DSPR | Disposition File Maintenance Response |
| EHRH | External History Request Response — Individual Identity History Subject Sheets |
| EMUF | Electronic (In) /Manual (Out) User Fee |
| ERRB | Biometric Transaction Search Error |

SECTION 2 – EBTS FUNCTIONAL CHANGES

| | |
|------|---|
| ERRL | Latent Transaction Error |
| ERRR | Transaction Error (Electronic Response) |
| ERRT | Tenprint Transaction Error |

| | |
|------|--------------------------------|
| FNDR | Federal No Charge Direct Route |
|------|--------------------------------|

| | |
|-----|-----------------------------------|
| IDC | Information Designation Character |
| IFS | Identification Firearms Sales |
| IHS | Identity History Summary |

| | |
|-----|---|
| IRR | Fingerprint Image Request Response |
|-----|---|

| | |
|------|--|
| NFUE | Non-Federal User f Fee Expedite |
|------|--|

| | |
|------|------------------------------------|
| NNDR | Non-Federal No Charge Direct Route |
|------|------------------------------------|

| | |
|-----|----------------------------|
| SRB | Search Results - Biometric |
|-----|----------------------------|

Section 3 – Aggregate List of Changes

This section records the changes made for EBTS TOU 1 through TOU 7. The implementation dates for each TOU are as follows:

| TOU | Date |
|------------|-------------|
| 10.0.1 | 2/5/14 |
| 10.0.2 | 6/2/14 |
| 10.0.3 | 9/30/14 |
| 10.0.4 | 3/13/15 |
| 10.0.5 | 6/13/15 |
| 10.0.6 | 6/20/16 |
| 10.0.7 | 12/5/16 |

| Section | TOU Number | Change |
|-----------------|-------------------|--|
| 1.8 | 10.0.4 | Added new compression references |
| | 10.0.7 | Added new reference |
| 3.1.1.6 EMUF | 10.0.1 | Updated second paragraph |
| 3.1.1.9 FIDR | 10.0.1 | Updated first paragraph |
| 3.1.3.1 RPIS | 10.0.1 | Updated second paragraph |
| 3.1.4 | 10.0.7 | Corrected ERRT name |
| 3.2.2 SRE | 10.0.7 | Corrected Table 3 reference in text |
| 3.3.1 | 10.0.5 | Updated Response TOT list for CPR |
| 3.3.1.1 IRQ | 10.0.1 | Updated first paragraph Added paragraph after the first paragraph |
| | 10.0.5 | Updated third paragraph |
| | 10.0.7 | Corrected name for ERRI in third paragraph |
| 3.3.1.3 IRR | 10.0.1 | Updated first paragraph |
| 3.3.1.4 ISR | 10.0.1 | Updated first paragraph |
| 3.3.2 | 10.0.3 | Updated Response Transaction list |
| 3.3.2.1 BATQ | 10.0.3 | Updated section |
| 3.3.2.2 BATR | 10.0.3 | Updated section title |
| 3.4.2 | 10.0.5 | Updated third paragraph |
| | 10.0.7 | Added "CMF Search?" to "ULF Flag Set?" Decision point in Search row in Figure 6 |
| 3.4.3 | 10.0.7 | Corrected ERRA transaction name |
| 3.4.4.2 TXTSRCH | 10.0.1 | Updated first paragraph Added second and third paragraphs, describing TOT use |
| 3.4.4.3 FRS | 10.0.5 | Updated first paragraph |
| | 10.0.6 | Added text to end of first paragraph |

SECTION 3 – EBTS FUNCTIONAL CHANGES

| Section | TOU Number | Change |
|---------------|------------|--|
| 3.4.4.4 SRB | 10.0.1 | Replaced second paragraph |
| 3.4.5.1 IIS | 10.0.4 | Updated sentence |
| 3.4.6 | 10.0.3 | Reordered sections to conform with Response Transaction list Corrected TOT name for EQHR and EQRR |
| 3.4.6.3 EQER | 10.0.3 | Restored EQER section |
| 3.4.6.4 EQRR | 10.0.5 | Updated first paragraph |
| 3.4.6.5 ERRR | 10.0.5 | Updated first paragraph and added second paragraph |
| | 10.0.7 | Updated first paragraph |
| 3.5 | 10.0.7 | Updated first paragraph |
| 3.5.1 SPN | 10.0.1 | Updated first paragraph |
| 3.5.6 ULM | 10.0.1 | Updated second paragraph |
| | 10.0.5 | Updated third paragraph |
| 3.6.3 BDEC | 10.0.2 | Updated section |
| | 10.0.3 | Updated second paragraph |
| 3.6.5 BDEL | 10.0.1 | Updated third paragraph |
| 3.6.13 FIS | 10.0.6 | Updated first paragraph |
| 3.6.14 FISR | 10.0.1 | Updated first paragraph |
| | 10.0.6 | Updated first paragraph |
| 3.6.15 SPMNT | 10.0.1 | Updated second paragraph |
| 3.6.23 RBMNTR | 10.0.3 | Updated first paragraph |
| 3.8.2 | 10.0.4 | Updated first and second paragraph |
| Appendix A | 10.0.3 | Restored Friction Ridge Investigation Search – Latent rows |
| | 10.0.4 | Updated Table A-1 |
| Appendix B | 10.0.1 | Added 1.011 NSR |
| | 10.0.3 | Updated 1.013 DOM |
| | 10.0.7 | Corrected description for 1.012 NTR |
| Appendix C | 10.0.1 | Relabeled column headings and table name, also reversed columns for Table 11 BID Values Table Updated 2.014 FBI Data Dictionary definition Updated 2.037 RFP Data Dictionary definition Updated 2.079 NCR Data Dictionary definition Updated 2.084 AMP Data Dictionary code table Updated 2.2010 NIR Data Dictionary definition Updated 2.2032C TOT of Dissemination for Max Length 2.2058 SMD spelling correction in SMI Values Table Updated 2.2069B RBT for Min Occurrences Updated 2.2069C RBEI for Min Occurrences |

SECTION 3 – EBTS FUNCTIONAL CHANGES

| Section | TOU Number | Change |
|---------|------------|---|
| | 10.0.2 | Updated 2.019 AKA Data Dictionary definition Updated 2.038 DPR Data Dictionary definition Added 2.046 DOS to Data Dictionary Added 2.046 DOS to Table C-1 Updated 2.088 NOT Data Dictionary definition Updated the data type for fields 2.2028G SMT, 2.2032I SMT, 2.2033M SMT and 2.2061D SMT |
| | 10.0.3 | Updated 2.098 NDR Values Table Updated 2.2020 RBSL |
| | 10.0.4 | Updated section 1.1 Updated 2.051 CSL definition Updated 2.2063 RBOO definition |
| | 10.0.5 | Updated 2.083 ULF name and definition Updated Table C-1 for 2.2064A RBFN and 2.2064B RBFT Updated Table C-1 for 2.071 ACN Example Updated Table C-1 for 2.083 ULF |
| | 10.0.6 | Updated 2.046 DOS definition Corrected IDENT description in Table 23: NDR Values Table |
| | 10.0.7 | Updated Table 17 IFS Values Table |
| | Appendix D | 10.0.1 |
| 10.0.2 | | Removed 2.096 RPR, 2.098 NDR, 2.2037 ESI from DOCE Removed 2.096 RPR, 2.098 NDR, 2.2015 RBXD, 2.2020 RBR, 2.2037 ESI, 2.2040 RBT, 2.2062 RBNF, 2.2063 RBOO, 2.2064 RBUD, 2.2065 RBC, 2.2067 RBDI, 2.2070 RBATN, 2.2071 RBST from EMUF Removed 2.2007 SDOB and 2.2008 SNAM from ERRT Updated section introduction |
| 10.0.6 | | Added field 2.046 DOS to CPNU and FIDR |
| 10.0.7 | | Removed 0..1 occurrence for field 2.2067 RBDI for FANC, FAUF, FNDR, MAP, NFUE, NFUF, and NNDR Removed 0..1 occurrence of field 2.2071 RBST for CAR, CPDR, and CPNU |

SECTION 3 – EBTS FUNCTIONAL CHANGES

| Section | TOU Number | Change |
|------------|------------|---|
| Appendix E | 10.0.1 | Updated 2.014 FBI for IRR Updated 2.018 NAM for EQHR and EQRR Updated 2.021 CTZ for EQHR Updated 2.037 RFP from UULD Updated 2.073 CRI for EHRR, EQER, EQHR, EQRR and ERRR Updated 2.075 ERS for RBN Updated 2.084 AMP for SRT Updated 2.084 AMP for TPIS and TPRS Updated 2.098 NDR for ISR Updated 2.2033 CNL for SRB Updated 2.026 SMT for TXTSRCH Updated 2.2058 SMD for TXTSRCH Updated 2.2059 TCL for TXTSRCH |
| | 10.0.2 | Added 2.046 DOS to CPR and PRR Removed 2.079 NCR from TPRR Updated section introduction |
| | 10.0.6 | Updated 2.073 CRI for FRS |
| Appendix F | 10.0.1 | Updated section 4.10.4 Requirement |
| | 10.0.4 | Update note under Table F-5 Update web site reference under Table F-5 |
| | 10.0.6 | Updated Table F-2 for minimum modulation for 500 ppi scanner to 2 cy/mm |
| | 10.0.7 | Added text in Section 4.10.6 that points to new reference Updated FAP 50 platen size in Table F-5 Added new document in References Updated Mobile ID version in References |
| Appendix H | 10.0.7 | Corrected sentence in second paragraph |
| Appendix I | 10.0.1 | Removed 2.006 ATN from XACT and XACTR Updated 2.014 FBI for PDR Removed 2.055 SLE from SRNR Added 2.073 CRI, 2.2100 SED, 2.2101 SST, 2.2102 RSC, 2.2103 STT, and 2.2104 SRA to SRNR Added 2.073 CRI and 2.075 ERS to SRNR Updated 2.084 AMP for FIS Updated 2.2035 EVI for DSPR |
| | 10.0.2 | Added 2.046 DOS to PDR and CPD Updated section introduction |
| Appendix J | 10.0.1 | Updated table heading for Table 45 Updated Table 46 Update table heading for Table 47 |
| Appendix K | 10.0.1 | Added sentence to end of section |

SECTION 3 – EBTS FUNCTIONAL CHANGES

| Section | TOU Number | Change |
|-------------|------------|--|
| Appendix L | 10.0.1 | Updated FIS for T17 Updated FIDR for T4 and T14 Updated IRR for T9 and T14 Updated IRQ Response TOTs |
| | 10.0.2 | Added 2.046 DOS to Table L-1 |
| | 10.0.4 | Corrected transaction name for EHRR Updated IIDS for T10 and T17 Updated IRR for T17 Updated SRB for T17 |
| | 10.0.5 | Updated Table L-1 for 2.083 ULF Updated Table L-4 for CPR |
| | 10.0.7 | Added ERRB to Table L-3 |
| Appendix M | 10.0.1 | Updated messages in Table M-1 based on Operational needs Added Error Class Key to Table M-1 |
| | 10.0.2 | Added A0015 to Message Table Added L0031 to Message Table Added M0033 to Message Table Added M0051 to Message Table Added M0052 to Message Table |
| | 10.0.3 | Added footnote |
| | 10.0.4 | Added L0174 and L0179 to Message Table |
| | 10.0.7 | Removed L0174 code from Table M-1 Added error message codes RB030 and RB031 to Table M-1 |
| Appendix N | 10.0.2 | Updated 14.015 PPC Data Dictionary definition |
| Appendix O | 10.0.1 | Corrected appendix introduction |
| | 10.0.4 | Updated appendix introduction |
| | 10.0.6 | Corrected CTZ value for four codes in POB Code Table Corrected FR code description |
| | 10.0.7 | Added South Sudan to Table O-1 |
| Appendix P | 10.0.4 | Updated section introduction text, sixth paragraph Updated web address for Palm Print Capture Guide Added note to Table P-2 Friction Ridge |
| Appendix AC | 10.0.4 | Removed acronyms IID, IIE, IIER, IIR and IRD Corrected EHRR |
| | 10.0.5 | Updated acronym ULF |
| | 10.0.6 | Corrected description for IIIS |

SECTION 3 – EBTS FUNCTIONAL CHANGES

| Section | TOU Number | Change |
|---------|------------|---|
| | 10.0.7 | Added acronym CMF Corrected DSPR Description Corrected EHRR Description Added ERRR Added acronym IFS Corrected IRR Description |