



Department of Justice
Federal Bureau of Investigation

**Technical Specifications Document for the
Repository for Individuals of Special Concern (RISC)
Prototype Project
Version 2.3**



Document Date: October 01, 2009

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Change History Section		
Version/ Revision	Revision Date	Description of Change
1.0	06/08/2007	Initial Release
2.0	12/10/2007	Deleted Section 3.5 RISC Notifications, Table 6.1 TAG = CRI changed from Optional to Mandatory, Table 6.2 TAG = ERS changed from Optional to Mandatory, Added Section 6.2.1 Response Caveats, Added "PIV" to Sections 9 and 10, Added Appendix A.
2.1	04/01/2008	Updated Section 3.2.4, Changed "Y" explanation in Section 3.4.2, Updated Section 5.2, Added field definitions to Section 5.3, Modified Sections 7.4 and 7.10, Revised bullets in Build 1 and Build 2 within Section 1.0, Removed the last sentence from the first paragraph in Section 4.1, Updated Section 5.3.4 (unused bytes and "Unknown Finger"), Modified Section 9, Added "Name" field to Sections 6.2 and 7, Modified Section 3.3, Modified Section 4.1, Added Section 6.2.2, Updated definitions for "ERS" and "RAP" in Section 7.
2.2	01/20/2009	Replaced ANSI/NIST-ITL 1-2007 version of table 5-1 with CJIS EBTS version, replaced ANSI/NIST-ITL 1-2007 version of table 5-5 with CJIS EBTS version, changed the name of Section 7.0, updated Section 7.1, updated Section 7.3, updated Section 7.13, added table 7-2 – Field Edit Specifications for RISC Type-2 Elements, updated table A-1.
2.3	10/01/2009	Removed ITF from Build 2 functionality in Section 1.0, Updated Section 3.3 to reflect incorporation of NRT updates to FIRS data, Updated Section 5.3.4 to reflect the need for a minimum of two Type-4 fingerprint impressions, Updated Table 6-1 and 6-2 to include the IMA and NOT fields respectively, Updated Section 6.2.2 to change field designation of Limited NCIC information in the RPISR ERS field, Added IMA and NOT fields to Table 7-2, Added "SAP" to Acronyms list, Added NIST Special Publication 500-280 to list of references, Updated Table A-1 to include SAP levels, removed all references to "Positive Identification".

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1.0 Introduction

The intent of the Repository for Individuals of Special Concern (RISC) Prototype is to provide the capability to receive and store biographic and fingerprint information associated with individuals marked as special concern. Enrollment into the RISC Prototype repository will be performed by both domestic and international agencies via bulk enrollments only. The information will be provided for searching against by both domestic and international participating agencies.

In addition, the RISC Prototype will provide a rapid search capability against the information contained within the RISC. The rapid search functionality provides the capability to perform a “Lights Out” identification search against a limited population with a significantly reduced response time in comparison to Ten-Print Fingerprint Identification Search response times. These Rapid Fingerprint Identification Searches are directed only against the RISC, which is anticipated to contain records for Wanted Persons, Known or Suspected Terrorists, and other persons of special interest. The result of a rapid search is a Red/Yellow/Green light response that will be distributed based upon a multi-tier dissemination methodology.

The RISC Prototype is a two delivery approach at providing the RISC repository, RISC search capabilities and rapid search functionality. The following functionality will be provided with each build:

Build 1

- Establish a categorized RISC repository
- Provide bulk fingerprint enrollment into RISC (including International Agencies)
- Support Unique Identity within the RISC repository
- Provide “Lights Out” search of RISC only (Domestic and International)
- Provide multi-tier dissemination responses for RISC searches
- Provide Rapid Search of RISC

Build 2

- Provide “limited” National Crime Information Center (NCIC) information related to a Red Response

The RISC Prototype focuses primarily on the creation of the RISC repository and the ability to support limited searches, including rapid searches, against the data contained only within the RISC. Existing Integrated Automated Fingerprint Identification System (IAFIS) repositories, such as the Criminal Master File (CMF) and the Unsolved Latent File (ULF), will not be included in these searches. All search capabilities provided by the RISC Prototype will be on a limited scale and will only be available to those organizations identified as Criminal Justice Information Services (CJIS) approved Pilot agencies.

2.0 Scope

The intent of this document is to outline the technical concepts and boundaries for the RISC Prototype. This document defines the types of search transactions that will be accepted, the types of responses returned to contributors and the system performance and availability anticipated for the RISC Prototype.

One goal of the RISC Prototype is to determine what information users will want returned in a response message. Therefore, the CJIS Electronic Biometric Transmission Specification (EBTS) fields used for transactions may change throughout the life of the RISC Prototype. These changes may not be reflected in the latest published version of the CJIS EBTS. Although this document contains excerpts from the CJIS EBTS and the American National Standards Institute, Inc.'s (ANSI) American National Standard for Information Systems — Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information, it does not provide the same level of detail contained in those documents. These three documents must therefore be used together in order to fully understand RISC transactions.

3.0 RISC Requirements

3.1 Data Exchange

IAFIS is bound by many internal Federal Bureau of Investigation (FBI) CJIS Division security policies. In order to meet operational deadlines, the RISC Prototype must follow these same security policies. All participants in the RISC Prototype are expected to comply with all security policies related to the dissemination and use of CJIS data.

3.1.1 Transfer Protocol

Due to internal FBI security concerns, RISC search requests must be submitted over the CJIS Wide Area Network (WAN) as Multipurpose Internet Mail Extensions (MIME) encoded e-mail attachments via Simple Mail Transfer Protocol (SMTP).

3.1.2 State Information Bureau (SIB)

All RISC search requests must be routed through the contributor's SIB or other authorized agency.

3.1.3 Originating Agency Identifier (ORI)

RISC search requests will utilize the submitting agencies existing IAFIS ORIs for all submissions.

3.1.4 E-Mail Address

RISC search requests must be sent to the following e-mail address:

3.2 General Policies and Guidelines

3.2.1 Use of Index Fingers

Due to the nature of records stored within the RISC repository, the RISC Prototype will have a greater hit rate if the request includes finger positions 2 and 7 (index fingers).

3.2.2 Bulk Searches not Allowed

The RISC Prototype will not accept bulk search requests.

3.2.3 Criminal Justice Purposes

RISC search requests should be for Criminal Justice Purposes only.

3.2.4 Limited Number of Requests per Day

In order to meet the rapid response time requirements of the RISC Prototype, the FBI reserves the right to limit the number and / or type of RISC search requests processed per day from any agency or SIB. The RISC Prototype was designed to provide a rapid response for **mobile** devices deployed in the field. Although a rapid response could justifiably be needed for many other types of transactions, the FBI requests that all agencies limit submissions to the target group of the RISC Prototype program.

3.3 RISC Searches

All searches of the RISC repository will be one to many Identification type searches. The RISC repository will contain a limited set of records which will be extracted from the Fingerprint Identification Record System (FIRS) stored within IAFIS on a Near Real Time (NRT) basis. The NRT activities will occur at least once every fifteen minutes. Consequently, the RISC repository might not have the most current data available to the FBI. Table 3-1 lists the type of records and frequency of record population that will be used in the RISC repository during the prototype stage of this project.

Table 3-1 – RISC Records

Record Type	Data Source	Frequency of Population
International Terrorist File (ITF)	FBI	As Needed
Wants and Warrants (W&W)	III	NRT
Sexual Offender Registry (SOR)	III	NRT
Known and Suspected Terrorist (KST)	FBI	NRT
Persons of Special Interest (Other)	FBI	NRT

In order to meet the rapid response times, all Rapid search requests will be fully automated (“Lights Out”) Automated Fingerprint Identification System (AFIS) searches. This means that thresholds may be adjusted in order to achieve accuracy and response time requirements of the RISC Prototype.

3.4 RISC Responses

During the prototyping phase, relevant transactions will be analyzed by the parties and their authorized contractors to assess system performance. Additionally, RISC system design will be refined using lessons learned and user input. System availability will be limited during this initiative; accordingly, the FBI CJIS Division is providing advance notice of sporadic system availability, backup recovery limitations, and failover shortfalls during the prototype phase. **Requestors should not rely solely on RISC search responses as the impetus for any law enforcement action.** Instead, search responses serve as potential links between submitted images and true identities that must be independently verified.

3.4.1 Response Times

Response times will be measured from the time the request is received at the IAFIS/RISC firewall until the response is returned to the IAFIS/RISC firewall.

3.4.2 SRF Field

The response to a RISC search request will utilize a single character in the SRF field indicating the following: “R” for Red, “Y” for Yellow or “G” for Green. An “R” will indicate that a viable candidate was identified. A viable candidate is not an absolute positive identification, but rather a response when the candidate score from the RISC search indicates a high likelihood of positive identification. A “Y” will indicate that the potential candidate(s) “match score” was not high enough for a high likelihood of a positive identification but not low enough to be eliminated from consideration. A “G” will indicate that no records within the RISC repository returned a “match score” high enough to be considered a potential candidate. The RISC Prototype will be used to determine the appropriate thresholds needed to obtain an acceptable level of accuracy while still providing meaningful responses. In addition, the prototype will help determine the type of response information that will be most beneficial to the user.

3.4.3 Multi Tiered Dissemination

Due to the potential sensitive nature of some records contained within the RISC repository, the prototype will utilize a multi tiered shared data structure for the dissemination of responses. The multi tiered shared data structure is defined as follows:

Tier 1 – A positive response is returned to the requestor (SRF of “R”) along with “limited” information related to the subject, if requested (after Build 2 of the RISC Prototype).

Tier 2 – A positive response is returned to the requestor (SRF of “R”) along with Contact Information in the 2.071-ACN field.

Tier 3 – A negative response is returned to the requestor (SRF of “G”) and Notification of the response is sent to the Record Owner (Silent Hit).

3.4.4 Response Routing

Responses to all RISC search requests must be routed through the contributor’s SIB or other authorized agency.

4.0 Image Resolution Requirements

Image resolution requirements are applicable to fingerprint images. Facial images rely on the total number of pixels scanned and transmitted and are not dependent on the specific scanning resolution used.

4.1 Scanner Resolution Requirement

The grayscale fingerprint images to be exchanged shall be captured by a mobile capture device operating at a specific native scanning resolution. The minimum scanning resolution for this capture process shall be 19.69 ppmm plus or minus 0.20 ppmm (500 ppi plus or minus 5 ppi). Scanning resolutions greater than this minimum value and with a device tolerance of plus or minus 1% may be used.

The recommended migration path to higher scanning resolutions for image capturing devices with a native scanning resolution of 19.69 ppmm (500 ppi) shall be at a rate of 100% of the current native scanning resolution. The recommended migration path progresses from 19.69 ppmm to 39.37 ppmm (500 ppi to 1000 ppi), from 39.37 ppmm to 78.74 ppmm (1000 ppi to 2000 ppi), etc. Capture devices with native scanning resolutions not in step with this migration path shall provide (through subsampling, scaling, or interpolating downward) an effective scanning resolution that matches the next lower interval in the migration path. For example, a device with native scanning resolution of 47.24 ppmm (1200 ppi) shall be required to provide an effective resolution of 39.37 ppmm (1000 ppi).

4.2 Transmitting Resolution Requirement

Each image to be exchanged shall have a specific resolution associated with the transmitted data. This transmitting resolution does not have to be the same as the scanning resolution. However, the transmitting resolution shall be within the range of permissible resolution values for that record type. When an image is captured at a scanning resolution greater than the permissible upper limit of the transmitting resolution for that record type, the image shall be subsampled, scaled, or interpolated down. This processing to reduce the scanning resolution to a lower effective resolution must be performed before the transmission occurs.

For high-resolution grayscale images, the preferred transmitting resolution shall be the same as the minimum scanning resolution of 19.69 ppmm plus or minus 0.20 ppmm (500 ppi plus or minus 5 ppi). Any transmitting resolution within the range of the minimum scanning resolution to a value of 20.47 ppmm plus or minus 0.20 ppmm (520 ppi plus or minus 5 ppi) is permitted for the processing of high-resolution records.

5.0 National Institute of Standards and Technology (NIST) Standards

5.1 Type – 1 Transaction Information Record

A Type-1 logical record is mandatory and is required for each RISC transaction. The Type-1 record shall provide information describing type and use or purpose for the transaction involved, a listing of each logical record included in the file, the originator or source of the physical record, and other useful and required information items.

Each field shall begin with the number of the record type followed by a period followed by the appropriate field number followed by a colon. Table 5-1 provides a list of the fields for the transaction information record. Within a Type-1 logical record, entries shall be provided in numbered fields. It is required that the first two fields of the record are ordered. For each of the fields, Table 5-1 lists the “condition” code, the field number, the field name, character type, field size, and occurrence limits. Based on a three digit field number, the maximum byte count size for the field is also given. The two entries in the “field size per occurrence” include all character separators used in the field. The “maximum Bytes” includes the field number, the information, and all the character separators. An entry containing an "*" indicate that there is no established limit.

Refer to Appendix B of the latest version of the CJIS EBTS for a detailed description of fields used within a Type-1 record.

Table 5-1 - Field List for Type-1 (Transaction) Logical Records

Identifier	Condition	Field No.	Field Name	Character Type	Field Size per Occurrence		Occurrences		Max. Bytes Including Character Separators & Field No.	Example Data	Special Characters Allowed
					Min.	Max.	Min.	Max.			
LEN	M	1.001	LOGICAL RECORD LENGTH	N	3	*	1	1	*	1.001:230<GS>	
VER	M	1.002	VERSION	N	5	5	1	1	11	1.002:0400<GS>	
CNT	M	1.003	FILE CONTENT	N	4	6	2	*	*	1.003:1<US>15<RS>2<US>00<RS>4<US>01<RS>4<US>02<RS>4<US>03<RS>4<US>04<RS>4<US>05<RS>4<US>06<RS>4<US>07<RS>4<US>08<RS>4<US>09<RS>4<US>10<RS>4<US>11<RS>4<US>12<RS>4<US>13<RS>4<US>14<GS>	
TOT	M	1.004	TYPE OF TRANSACTION	A	4	5	1	1	11	1.004:RPIS<GS>	
DAT	M	1.005	DATE	N	9	9	1	1	15	1.005:20080327<GS>	
PRY	O	1.006	TRANSACTION PRIORITY	N	2	2	0	1	8	1.006:1<GS>	
DAI	M	1.007	DESTINATION AGENCY	AN	*	*	1	1	*	1.007:DCFBWA6Z<GS>	
ORI	M	1.008	ORIGINATING AGENCY IDENTIFIER	AN	*	*	1	1	*	1.008:NY0303000<GS>	
TCN	M	1.009	TRANSACTION CONTROL NUMBER	ANS	*	*	1	1	*	1.009:1234567890<GS>	Any printable 7-bit ASCII character is allowed.
TCR	O	1.010	TRANSACTION CONTROL REFERENCE	ANS	*	*	0	1	*	1.010:1234567890<GS>	Any printable 7-bit ASCII character is allowed.
NSR	M	1.011	NATIVE SCANNING RESOLUTION	NS	6	7	1	1	13	1.011:20.00<GS>	Period allowed.
NTR	M	1.012	NOMINAL TRANSMITTING RESOLUTION	NS	6	7	1	1	13	1.012:20.00<GS>	Period allowed.
DOM	O	1.013	DOMAIN NAME	AN	*	*	0	1	*	1.013:NORAM<GS>	
GMT	O	1.014	GREENWICH MEAN TIME	AN	16	16	0	1	22	1.014:20061025132400Z<GS>	
DCS	O	1.015	DIRECTORY OF CHARACTER SETS	ANS	*	*	0	*	*	1.015:003<US>UTF-8<FS>	

* No limits defined. Under the Condition column: O = optional; M = mandatory; C = conditional.

Under the character type column: A = alpha; B = binary; N = numeric; S = special characters.

5.2 Type – 2 User-Defined Descriptive Text Record

Type-2 logical records shall contain user-defined textual fields providing identification and descriptive information associated with the subject of the transaction. Data contained in this record shall conform in format and content to the specifications of the domain name as listed in the 1.013-Domain Name field found in the Type-1 record.

Type-2 logical records shall contain textual information relating to the subject of the transaction and shall be represented in an American Standard Code for Information Interchange (ASCII) format. This record may include such information as the state or FBI numbers, physical characteristics, demographic data, and the subject's criminal history. Every transaction usually contains one or more Type-2 records which are dependent upon the entry in the 1.004-Type-of-Transaction (TOT) Field (see Sections 6 and 7 of this document).

5.3 Type – 4 Fingerprint Image Records

Type-4 logical records shall contain and be used to exchange high-resolution grayscale fingerprint image data that was scanned at no less than the minimum scanning resolution. Alternatively, the native scanning resolution may be used. But in either case, if the scanning resolution is greater than the upper limit of the permissible transmitting resolution, the scanned data shall be subsampled, scaled down, or interpolated. The resultant transmitting resolution shall be within the bounds of the permissible transmitting resolutions for high-resolution fingerprint images.

Within each logical record, entries shall be provided in nine ordered and unnumbered fields. The data recorded is in binary form – no ASCII data. The first eight fields are fixed length and total eighteen bytes. These fields precede the image data contained in field nine. The size of the ninth field is eighteen bytes less than the value specified in the LEN field. Table 5-2 lists the contents of each of the nine fields.

Table 5-2 – Type-4 Record Layout

Field Number	Tag	Field Description	Byte Count	Byte Position
1	LEN	Logical record length	4	1-4
2	IDC	Image designation character	1	5
3	IMP	Impression type	1	6
4	FGP	Finger position	6	7-12
5	ISR	Image scanning resolution	1	13
6	HLL	Horizontal line length	2	14-15
7	VLL	Vertical line length	2	16-17
8	GCA / BCA	Compression algorithm	1	18
9	DATA	Image data	<LEN> – 18	19 through <LEN>

5.3.1 Logical Record Length (LEN)

This mandatory four-byte binary field shall contain the length of the logical record specifying the total number of bytes, including every byte of all nine fields contained in the record.

5.3.2 Image Designation Character (IDC)

This mandatory one-byte binary field shall be used to identify the image data contained in this record. The IDC contained in this field shall be a binary representation of the IDC found in the 1.003-File Content (CNT) field of the Type-1 record.

5.3.3 RISC Impression Type (IMP)

This mandatory one byte binary field shall contain the code, selected from Table 5-3, describing the manner by which the fingerprint image information was obtained.

Table 5-3 - RISC Finger Impression Types

Description	Code
Live-scan plain	0
Live-scan rolled	1
Nonlive-scan plain	2
Nonlive-scan rolled	3
Live-scan optical contact plain	20
Live-scan optical contact rolled	21
Live-scan non-optical contact plain	22

Description	Code
Live-scan non-optical contact rolled	23
Live-scan optical contactless plain	24
Live-scan optical contactless rolled	25
Live-scan non-optical contactless plain	26
Live-scan non-optical contactless rolled	27
Other	28
Unknown	29

5.3.4 RISC Finger Position (FGP)

This mandatory fixed-length field of six binary bytes shall contain possible finger positions beginning in the leftmost byte of the field (byte seven of the record). The decimal code number corresponding to the known or most probable finger position shall be taken from Table 5-4 and entered as a binary number right justified and left zero filled within the eight-bit byte. For the RISC Prototype, the remaining five unused bytes shall be filled with the binary equivalent of “255”. Also specific to the RISC Prototype, a minimum of two and maximum of ten unique Type-4 logical records can be sent with each transaction and each record can only contain one fingerprint impression. Table 5-4 also lists the maximum image width and height dimensions for each of the finger positions.

Table 5-4 - RISC Finger Position Codes

Finger position	Finger code	Width		Length	
		(mm)	(in)	(mm)	(in)
Right thumb	01	40.6	1.6	38.1	1.5
Right index finger*	02	40.6	1.6	38.1	1.5
Right middle finger	03	40.6	1.6	38.1	1.5
Right ring finger	04	40.6	1.6	38.1	1.5
Right little finger	05	40.6	1.6	38.1	1.5
Left thumb	06	40.6	1.6	38.1	1.5
Left index finger*	07	40.6	1.6	38.1	1.5
Left middle finger	08	40.6	1.6	38.1	1.5
Left ring finger	09	40.6	1.6	38.1	1.5
Left little finger	10	40.6	1.6	38.1	1.5

* Right and Left Index Fingers are preferred

5.3.5 Image Scanning Resolution (ISR)

This mandatory one-byte field shall contain a binary value of “0” if the minimum scanning resolution is used and a “1” if the native scanning resolution is used.

5.3.6 Horizontal Line Length (HLL)

This mandatory two-byte binary field shall be used to specify the number of pixels contained on a single horizontal line of the transmitted image.

5.3.7 Vertical Line Length (VLL)

This mandatory two-byte binary field shall be used to specify the number of horizontal lines contained in the transmitted image.

5.3.8 RISC Compression Algorithm (GCA / BCA)

This mandatory one-byte binary field shall be used to specify the type of compression algorithm used. For the RISC Prototype, a binary one (1) denoting Wavelet Scalar Quantization (WSQ) is the only high-resolution grayscale data algorithm supported.

Table 5-5 – RISC Grayscale Compression Code

Algorithm Name	Binary Code (in base 10)	ASCII Code
WSQ Version 2.0	1	WSQ20

5.4 Type – 10 Facial Image Record

Type-10 tagged-field image records shall contain and be used to exchange facial image data together with textual information pertinent to the digitized image. The source of the image data shall be the image captured from scanning a photograph, a live image captured with a digital camera, or a digitized “freeze-frame” from a video camera.

Table 5-6 lists each of the mandatory and optional fields present in a Type-10 logical record. Within a Type-10 logical record, entries shall be provided in numbered fields. It is required that the first two fields of the record are ordered, and the field containing the image data shall be the last physical field in the record. For each field of the Type-10 record, Table 5-6 lists the “condition” code, the field number, the field name, character type, field size, and occurrence limits. Based on a three digit field number, the maximum byte count size for the field is also given. As more digits are used for the field number, the maximum byte count will also increase. The two entries in the “field size per occurrence” include all character separators used in the field. The “maximum byte count” includes the field number, the information, and all the character separators.

Table 5-6 – Field List for Type-10 (Subject Photo) Logical Record Layout

Identifier	Condition	Field No.	Field Name	Character Type	Field Size Per Occurrence		Occurrences		Max. No. of Bytes Incl. Character Separators and Field Number	Example Data
					Min.	Max.	Min.	Max.		
LEN	M	10.001	LOGICAL RECORD LENGTH	N	4	8	1	1	15	10.001:909<GS>
IDC	M	10.002	IMAGE DESIGNATION CHARACTER	N	2	5	1	1	12	10.002:0200<GS>
IMT	M	10.003	IMAGE TYPE	A	5	7	1	1	14	10.003:FACE<GS>
SRC	M	10.004	SOURCE AGENCY/ORI	AN	10	36	1	1	43	10.004:NY0303000S<GS>
PHD	M	10.005	PHOTO DATE	N	9	9	1	1	16	10.005:19960201<GS>
HLL	M	10.006	HORIZONTAL LINE LENGTH	N	4	5	1	1	12	10.006:480<GS>
VLL	M	10.007	VERTICAL LINE LENGTH	N	4	5	1	1	12	10.007:600<GS>
SLC	M	10.008	SCALE UNITS	N	2	2	1	1	9	10.008:0<GS>
HPS	M	10.009	HORIZONTAL PIXEL SCALE	N	2	5	1	1	12	10.009:01<GS>
VPS	M	10.010	VERTICAL PIXEL SCALE	N	2	5	1	1	12	10.010:01<GS>
CGA	M	10.011	COMPRESSION ALGORITHM	AN	4	6	1	1	13	10.011:JPEGB<GS>
CSP	M	10.012	COLOR SPACE	A	4	5	1	1	12	10.012:YCC<GS>
SAP	C	10.013	SUBJECT ACQUISITION PROFILE	N	2	4	1	1	11	10.013:11<GS>
SHPS	O	10.016	SCAN HORIZONTAL PIXEL SCALE	N	2	5	0	1	12	10.016:<GS>
SVPS	O	10.017	SCAN VERTICAL PIXEL SCALE	N	2	5	0	1	12	10.017:<GS>
POS	M	10.020	SUBJECT POSE	A	2	2	0	1	9	10.020:L<GS>
POA	O	10.021	POSE OFFSET ANGLE	N	2	5	0	1	12	10.021:45<GS>
PXS	O	10.022	PHOTO DESCRIPTION	A	4	21	0	9	196	10.022:GLASSES<GS>
PAS	O	10.023	PHOTO ACQUISITION SOURCE	A	7	15	0	1	22	10.023:<GS>
SQS	O	10.024	SUBJECT QUALITY SCORE	N	10	35	0	9	322	10.024:<GS>
SPA	O	10.025	SUBJECT POSE ANGLES	N	9	23	0	1	30	10.025:<GS>
SXS	O	10.026	SUBJECT FACIAL DESCRIPTION	A	6	21	0	50	1,057	10.026:<GS>
SEC	O	10.027	SUBJECT EYE COLOR	A	4	4	0	1	11	10.027:<GS>
SHC	O	10.028	SUBJECT HAIR COLOR	A	4	8	0	2	23	10.028:<GS>
SFP	O	10.029	SUBJECT FEATURE POINTS	N	10	18	0	88	1,591	10.029:<GS>
DMM	O	10.030	DEVICE MONITORING MODE	A	8	11	0	1	18	10.030:<GS>
SMT	C	10.040	NCIC DESIGNATION CODE	A	4	11	1	3	40	10.040:XXXXXX<GS>
SMS	O	10.041	SCAR/MARK/TATTOO SIZE	N	4	6	0	1	13	10.041:20<US>40<GS>
SMD	O	10.042	SMT DESCRIPTORS	AN	16	51	0	9	466	10.042:TATTOO<US>SYMBOL<US>GANG<US>MS13<GS>
COL	O	10.043	COLORS PRESENT	A	4	21	0	9	196	10.043:BLACK<GS>
DAT	M	10.999	IMAGE DATA	B	2	5,000,000	1	1	5,000,008	10.999:image data<FS>

Under the Condition column: O = optional; M = mandatory; C = conditional.

Under the Character Type column: A = alpha; B = binary; N = numeric; S = special characters.

Refer to section 15 of the American National Standards Institute, Inc.’s American National Standard for Information Systems — Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information Approved 04/20/2007 for a detailed description of fields used within a Type-10 record.

5.5 Information Separators

In the tagged-field logical records, mechanisms for delimiting information are implemented by use of the four ASCII information separators. The delimited information may be items within a field or subfield, fields within a logical record, or multiple occurrences of subfields. These characters are used to separate and qualify information in a logical sense. Viewed in a hierarchical relationship, the File Separator “*FS*” character is the most inclusive followed by the Group Separator “*GS*”, the Record Separator “*RS*”, and finally the Unit Separator “*US*” characters. Table 5-7 lists these ASCII separators and a description of their use within this standard. Information separators should be functionally viewed as an indication of the type data that follows. The “*US*” character shall separate individual information items within a field or subfield. This is a signal that the next information item is a piece of data for that field or subfield. Multiple subfields within a field separated by the “*RS*” character signals the start of the next group of repeated information item(s). The “*GS*” separator character used between information fields signals the beginning of a new field preceding the field identifying number that shall appear. Similarly, the beginning of a new logical record shall be signaled by the appearance of the “*FS*” character.

Table 5-7 - Information Separators

ASCII character	Description
<i>FS</i>	Separates logical records of a file or is the terminating character of a transaction
<i>GS</i>	Separates fields of a logical record
<i>RS</i>	Separates multiple data entries (subfields) of an Information field
<i>US</i>	Separates individual information items of the field or subfield

The four characters are only meaningful when used as separators of data items in the fields of the ASCII text records. There is no specific meaning attached to these characters occurring in binary image records and binary fields – they are just part of the exchanged data.

Normally, there should be no empty fields or information items and therefore only one separator character should appear between any two data items. The exception to this rule occurs for those instances where the data in fields or information items in a transaction are unavailable, missing, or optional, and the processing of the transaction is not dependent upon the presence of that particular data. In those instances, multiple and adjacent separator characters shall appear together rather than requiring the insertion of dummy data between separator characters.

Refer to section 8.2.1 of the American National Standards Institute, Inc.'s American National Standard for Information Systems — Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information Approved 04/20/2007 for a detailed description of information separators.

5.6 International Character Sets

All of the fields in the Type-1 transaction record must be recorded using the 7-bit ASCII code, which is the default character set code within a transaction. In order to affect data and transaction interchanges between non-English speaking or based agencies, a technique is available to encode information using character sets other than 7-bit ASCII. Fields from the Type-1 logical record and ASCII "LEN" and "IDC" text fields must still be encoded using 7-bit ASCII. But all other designated text fields can be encoded using alternate character sets. The general mechanism for accomplishing this provides for backward compatibility with existing readers, supports multiple character sets in a single text string, and handles internationally accepted character sets and text order conventions such as International Standards Organization (ISO) character sets, UTF-8, and Unicode.

To switch character sets within a transaction, the Type-1 record shall contain a field listing the Directory of Character Sets (DCS) used in the transaction. The DCS is an ordered list of triples, each consisting of 3 information items containing an identifying code, the name of an international character set, and its version. The code for a specific character set and other special codes shall be embedded in the transaction to signal the conversion to a different international character set. The ASCII Start-of-Text "STX" character (0x02) followed by the equal sign "=" is used to signal the change to an alternate character set defined by the specific DCS code that follows. The entire Start-of-Text sequence is terminated by a single instance of the ASCII End-of-Text "ETX" character (0x03). This alternate character set will remain active until a closing "ETX" character is encountered or the next ASCII information separator character is encountered.

The base-64 encoding scheme, found in email, shall be used for converting non-ASCII text into ASCII form. By convention, any language or character set text string following the Start-of-Text character sequence will be base-64 encoded for subsequent processing. The field number including the period and colon, for example "2.001:", in addition to the "US", "RS", "GS", and "FS" information separators shall appear in the transaction as 7-bit ASCII characters without conversion to base-64 encoding.

All text between the STX sequence and the closing ETX character shall be encoded in base-64 notation. This is true even when the 7-bit ASCII character set is specified.

Usage of UTF-8 is allowed as an alternative to the technique that requires the usage of the ASCII "STX" and "ETX" characters to signify the beginning or end of international characters. UTF-8 is only allowed to be used for user-defined fields of all the tagged-field records. Even though there is no overlap within the character sets used with UTF-8, it should be registered in the type 1 record within DCS field 1.15 (Directory of Character Sets).

Refer to section 8.2.3 of the American National Standards Institute, Inc.'s American National Standard for Information Systems — Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information Approved 04/20/2007 for a detailed description of International Character Sets.

6.0 Types-of-Transactions (TOT)

All RISC Prototype transactions must be CJIS EBTS compliant. Although these specifications are currently being revised, Sections 6 and 7 of this document describe the CJIS EBTS fields that will be used for each TOT's Type-2 record.

6.1 Rapid Print Image Search (RPIS)

This transaction is a one-to-many, rapid response, and "Lights Out" search request. It contains the descriptive data and a range of two to ten rolled or flat fingerprint images. The types and quantities of logical records required in a RPIS submission are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record (see Table 6-1)
- 2-10 Type-4 Rolled or Flat fingerprint images

Table 6-1 - RPIS EBTS fields for Type-2 Descriptive Record

• TAG-Elem	• RPIS
• 2.001-LEN	• 1 - Mandatory
• 2.002-IDC	• 1 - Mandatory
• 2.006-ATN	• 1 - Mandatory
• 2.009-OCA	• 1 - Optional
• 2.067-IMA	• 1 - Optional
• 2.070-RAP	• 1 - Optional
• 2.073-CRI	• 1 - Mandatory
• 2.096-RPR	• 1 - Optional
• 2.098-NDR	• 1 - Mandatory

6.2 Rapid Print Image Search Response (RPISR)

This transaction is the response returned by the RISC Prototype to an RPIS submission. The types and quantities of logical records required in a RPISR submission are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record (see Table 6-2)

Table 6-2 - RPISR EBTS fields for Type-2 Descriptive Record

• TAG-Elem	• RPISR
• 2.001-LEN	• 1 – Mandatory
• 2.002-IDC	• 1 – Mandatory
• 2.006-ATN	• 1 – Mandatory
• 2.014-FBI	• 1 – Optional
• 2.018-NAM	• 1 – Optional
• 2.059-SRF	• 1 – Mandatory
• 2.071-ACN	• 1 – Optional
• 2.073-CRI	• 1 – Optional
• 2.075-ERS	• 1 – Optional
• 2.088-NOT	• 1 – Mandatory

6.2.1 Response Caveats

The 2.088-NOT field will contain the following response caveat(s) required by the IAFIS Interface Evaluation Task Force (IIETF) and approved by the CJIS Advisory Policy Board (APB) Working Groups:

- All Responses
 - *“THIS RESPONSE IS BASED ON A SEARCH OF ONLY THE REPOSITORY FOR INDIVIDUALS OF SPECIAL CONCERN AND DOES NOT PRECLUDE A RECORD FROM EXISTING IN OTHER BIOMETRIC OR NAME BASED REPOSITORIES.”*
- Yellow Responses
 - *“YOUR SEARCH OF THE REPOSITORY FOR INDIVIDUALS OF SPECIAL CONCERN COULD NOT PROVIDE A DEFINITIVE GREEN OR RED RESPONSE.”*

6.2.2 “Limited” NCIC Information

The 2.075-ERS field will contain “limited” data extracted from NCIC when requested by the submitting agency by setting the optional RAP field value to “Y”. Dependent upon the search results, the RISC prototype will utilize the validated ORI supplied in the CRI field to obtain this additional information. One of the goals of the RISC Prototype is to define exactly what information will be the most useful to all users. Therefore, the exact layout of this field is subject to change throughout the life of the RISC Prototype and will not be discussed within this document.

6.3 ITF

This transaction is a one-to-many, non-rapid response and non “Lights Out” search request. It contains the descriptive data and a range of two to ten rolled or flat fingerprint images. The types and quantities of logical records required in a ITF submission are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record (see Table 6-3)
- 2-10 Type-4 Rolled or Flat fingerprint images

Table 6-3 - ITF EBTS fields for Type-2 Descriptive Record

• TAG-Elem	• ITF
• To Be Determined	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•

6.4 ITFR

This transaction is the response returned by the RISC Prototype to an ITF submission. The types and quantities of logical records required in an ITFR submission are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record (see Table 6-4)

Table 6-4 - ITFR EBTS fields for Type-2 Descriptive Record

• TAG-Elem	• ITFR
• To Be Determined	•
•	•
•	•
•	•
•	•
•	•
•	•
•	•

6.5 ITF Maintenance

To Be Determined

6.6 ITF Maintenance Response

To Be Determined

6.7 Error Messages

These types of transactions are returned by the RISC Prototype to indicate a transaction error. The types and quantities of logical records required in error messages are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record

Refer to Appendix M in the latest version of the CJIS EBTS for details about error messages.

7.0 Descriptors and Field Edit Specifications for Type-2 Logical Records used by RISC

This is a consolidated list of CJIS EBTS fields used for RISC transactions. Refer to Appendix C of the latest version of the CJIS EBTS for a comprehensive list of all CJIS EBTS descriptors and field edit specifications for type-2 logical records.

7.1 ACN 2.071 - Action to be Taken

This field shall contain additional information such as record type (e.g. W&W, KST, SOR) and contact information when a Red (“R”) value is returned in the 2.059-SRF field. When the same FBI number has been entered into RISC with different record types, the record type returned in the response is based on a prioritized list with Wants and Warrants (W&W) being the highest priority.

7.2 ATN 2.006 - "Attention" Indicator

This alphanumeric-special field shall contain a designation of the individual to whose attention a response is to be directed. Periods shall not be used (e.g., Det. J. Q. Public shall be entered as DET J Q PUBLIC). The value of ATN returned to the submitter is the value submitted.

7.3 CRI 2.073 - Controlling Agency Identifier

For EBTS purposes, this field shall be a nine-byte alphanumeric field. If an agency is submitting for an entity outside of its respective state, the channeling agency need only ensure that submitted CRIs represent valid ORIs that have been added to the IAFIS Computerized Contributor Address (CCA) file.

7.4 ERS 2.075 - Electronic RAP Sheet

This free-text field shall contain “limited” NCIC information, when requested by the submitting agency by setting the optional RAP field value to “Y”. Dependent upon the search results, the RISC prototype will utilize the validated ORI supplied in the CRI field to obtain this additional information. The field shall consist of lines with a maximum of 74 characters per line (text of 72 plus 2 line control characters).

7.5 FBI 2.014 - FBI Number

This field contains the subject’s FBI number, if known. A valid FBI number shall be no more than nine alphanumeric characters. The FBI number returned in a response is dependent upon the search results.

7.6 IDC 2.002 - Image Designation Character

This mandatory field shall be used to identify the user-defined text information contained in this record. The IDC contained in this field shall be the IDC of the Type-2 logical record as found in the file content field of the Type-1 record.

7.7 IMA 2.067 - Image Capture Equipment

This free-text field is used to log the make, model, and serial number of the equipment used to acquire images. It is a grouped field composed of three subfields: the Make (MAK), Model (MODL), and Serial Number (SERNO) of the acquisition device separated by the ^U_S separator character.

7.8 LEN 2.001 - Logical Record Length

This field contains the length of the logical record specifying the total number of bytes, including every character of every field contained in the record. The number of characters added to the record by the LEN field itself shall be included in calculating the value of LEN.

7.9 NAM 2. 018 - Name

This alpha-special field contains the name(s) of the subject. The format shall be the surname followed by a comma (,) followed by the given name(s), which are separated by a space. Hyphens, commas, and blanks are allowed as special characters. Numerals are not allowed.

7.10 NDR 2.098 - Name of Designated Repository

This field contains the numerical designation of the repository(ies) to be searched. Repository numbers are assigned by the FBI CJIS division. Multiple entries in this field will indicate a desire to search more than one repository. Multiple entries will be separated by the <RS> separator. Table 7-1 lists the NDR values accepted by the RISC Prototype.

Table 7-1 – RISC Related NDR Values

NDR Value	File Name
10	International Terrorist File (ITF) Participants
11	RISC Wants and Warrants (W&W)
12	RISC Sexual Offender Registry (SOR)
13	RISC Known and Suspected Terrorist (KST)
14	RISC International Terrorist File (ITF)
15	RISC Persons of Special Interest (Other)

7.11 NOT 2.088 - Note Field

This free-text field is used to provide response caveat(s) required by the IIETF and approved by the CJIS APB Working Groups. The field shall consist of lines with a maximum of 74 characters per line (text of 72 plus 2 line control characters).

7.12 OCA 2.009 - Originating Agency Case Number

This field contains the one to twenty character Originating Agency Case Identifier (OCA) that has been assigned by the originating agency. This alphanumeric-special (ANS) field may contain any printable 7-bit ASCII character with the exception of the period (“.”). The OCA field must not begin with a blank.

7.13 RAP 2.070 - Request for Electronic RAP Sheet

The purpose of this field is to allow the contributors to optionally request “limited” NCIC information related to the suspect. A "Y" indicates that information extracted from NCIC is desired and an omitted field or an “N” indicates that no NCIC information should be returned with the response.

7.14 RPR 2.096 - Request Photo Record

This one-character alpha field is used to indicate a user’s desire to have the RISC Prototype return a Type-10 photo record if one is on file and disseminable.

7.15 SRF 2.059 - Search Results Findings

This field is only used in submission responses and contains a single character. For the RPISR TOT, the SRF field will contain one of the following: “R” for Red, “Y” for Yellow or “G” for Green.

Table 7-2 - Field Edit Specifications for RISC Type-2 Elements

Field No.	Identifier	Field Name	Character Type	Field Size		Example	Special Characters
				Min.	Max.		
2.001	LEN	LOGICAL RECORD LENGTH	N	2	7	2.001:909<GS>	
2.002	IDC	IMAGE DESIGNATION CHARACTER	N	2	2	2.002:00<GS>	
2.006	ATN	"ATTENTION" INDICATOR	ANS	3	30	2.006:SA J Q DOE, RM 11867<GS>	Any printable 7-bit ASCII character with the exception of the period is allowed.
2.009	OCA	ORIGINATING AGENCY CASE NUMBER	ANS	1	20	2.009:Q880312465<GS>	Any printable 7-bit ASCII character with the exception of the period is allowed.
2.014	FBI	FBI NUMBER	AN	1	9	2.014:62760NY12<GS>	
2.018	NAM	NAME	AS	3	30	2.018:JONES, ANTHONY P<GS>	Commas, hyphens, and blanks are all allowed as special characters.
2.059	SRF	SEARCH RESULTS FINDINGS	A	1	1	2.059:R<GS>	
2.067	IMA	IMAGE CAPTURE EQUIPMENT	SET			2.067:DBI<US>1134<US>12345<GS>	Any printable 7-bit ASCII character is allowed.
2.070	RAP	REQUEST FOR ELECTRONIC RAP SHEET	A	1	1	2.070:Y<GS>	
2.071	ACN	ACTION TO BE TAKEN	ANS	0	300	2.071:IF NON-IDENT, SUBMIT TO UNSOLVED LATENT FILE<GS>	Commas, hyphens, ampersands, slashes, number signs, and blanks are all allowed as special characters.
2.073	CRI	CONTROLLING AGENCY IDENTIFIER	ANS	1	9	2.073:NY0303000<GS>	
2.075	ERS	ELECTRONIC RAP SHEET	ANS	4	200,000	2.075:<rap sheet example here><GS>	Any printable 7-bit ASCII character is allowed.
2.088	NOT	NOTE FIELD	ANS	1	1,000	2.088:NOTE<GS>	Any printable 7-bit ASCII character is allowed.
2.096	RPR	REQUEST PHOTO RECORD	A	1	1	2.096:Y<GS>	
2.098	NDR	NAME OF DESIGNATED REPOSITORY	N	1	3	2.098:1<GS>	

Under the Character Type column: A = alpha, B = binary, N = numeric, S = special characters.

8.0 FBI Points of Contact

Table 8-1 lists the CJIS Divisions points of contact for the RISC Prototype.

Table 8-1 – FBI RISC Points of Contact

Name	Area	Phone	E-Mail
Gregory T. Voreh	Technical	(304) 625-2918	gvoreh@leo.gov
David L. Jones	Administrative	(304) 625-4850	djones9@leo.gov

9.0 Acronyms

Table 9-1 lists Acronyms used within this document.

Table 9-1 – Acronyms

Acronym	Definition
AFIS	Automated Fingerprint Identification System
ANS	Alphanumeric-special
ANSI	American National Standards Institute, Inc.
APB	Advisory Policy Board
ASCII	American Standard Code for Information Interchange
CJIS	Criminal Justice Information Services
CMF	Criminal Master File
DCS	Directory of Character Sets
EBTS	Electronic Biometric Transmission Specification
FBI	Federal Bureau of Investigation
FIRS	Fingerprint Identification Record System
IAFIS	Integrated Automated Fingerprint Identification System
IDRR	Identification Record Report
IIETF	IAFIS Interface Evaluation Task Force
III	Interstate Identification Index
ISO	International Standards Organization
ITF	International Terrorist File
KST	Known and Suspected Terrorist
MIME	Multipurpose Internet Mail Extensions
NCIC	National Crime Information Center
NIDR	Non-Identification Response
NIST	National Institute of Standards and Technology
ORI	Originating Agency Identifier
PIV	Personal Identity Verification
ppi	Pixels per inch
ppmm	Pixels per millimeter
RISC	Repository for Individuals of Special Concern
RPIS	Rapid Print Image Search
RPISR	Rapid Print Image Search Response
SAP	Subject Acquisition Profile
SIB	State Information Bureau
SMTP	Simple Mail Transfer Protocol
SOR	Sexual Offender Registry
TOT	Type-of-Transaction
ULF	Unsolved Latent File
WAN	Wide Area Network
WSQ	Wavelet Scalar Quantization

10.0 References

1. **NIST Special Publication 500-271** -- American National Standards Institute, Inc.'s American National Standard for Information Systems — Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information Approved 04/20/2007 which can be downloaded at <http://Fingerprint.NIST.Gov/Standard/>.
2. Criminal Justice Information Services (CJIS) Electronic Biometric Transmission Specification (EBTS), IAFIS-DOC-01078-8.0 Draft, V8.0, 2006.
3. Personal Identity Verification (PIV) Image Quality Specifications for Single Finger Capture Devices.
4. **NIST Special Publication 500-280** –Mobile ID Device Best Practice Recommendation Version 1.0, August 2009

Appendix A - Image Quality Specifications

Mobile Fingerprint Scanners

Digital softcopy images obtained from mobile fingerprint scanners must have sufficient quality to allow the following functions to be performed: (1) conclusive fingerprint comparisons; (2) fingerprint classification; (3) automatic feature detection; and (4) overall AFIS search reliability.

Mobile fingerprint scanners must be capable of producing images that exhibit good geometric fidelity, sharpness, detail rendition, gray-level uniformity, and gray-scale dynamic range, with low noise characteristics. The images must be true representations of the input fingerprints, without creating any significant artifacts, anomalies, false detail, or cosmetic image restoration effects.

Table A-1 gives the requirements for mobile fingerprint scanners used in the RISC Prototype.

Table A-1 - RISC Prototype Mobile Fingerprint Scanner Requirements

SAP	# of Fingers Captured	Minimum Graylevels	Minimum Image Dimensions (WxH)	Maximum Compression Ratio	Certification of Sensor	Transmission
30	1	256	0.8" x 1.0"	10:1	PIV^	Image
40	1 to 2	256	1.6" x 1.5"	15:1	PIV^	Image
45	1 to 2	256	1.6" x 1.5"	15:1	App. F*	Image
50	1 to 3	256	2.5" x 1.5"	15:1	App. F*	Image
60	1 to 4	256	3.0" x 3.2"	15:1	App. F*	Image

^ - Personal Identity Verification (PIV) Image Quality Specifications for Single Finger Capture Devices.

* - CJIS EBTS Appendix F.

NOTE: Although the RISC Prototype will accept submissions from Mobile Fingerprint Scanners that don't meet these requirements, the CJIS Division reserves the right to enforce these, or any other, scanner requirements deemed necessary to meet accuracy levels established by the CJIS Division's Advisory Policy Board.