U. S. Department of Justice
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Science and Technology Branch

CODIS Rapid Import Common Message Format (Rapid Import CMF)

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Laboratory Division – Biometrics Analysis Section
CODIS Unit - Program Management Office
2501 Investigation Parkway
FBI Academy Complex
Quantico, VA 22135

Revision History

Rev#	Date	Initials	Description
16	9/11/2017	KME	Baseline version for public release
17	4/30/2019	KME	Added kit FlexPlex27 and STR locus D6S1043. Added Y-STR loci listed in the STR Import CMF 3.3 ISD revision 10.

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1.0 OVERVIEW

This specification describes the interface between the Rapid DNA instruments and the CODIS Rapid Enrollment (CRE) application. The Rapid DNA instrument will be capable of combining information from the AEF file with the specimen's DNA profile into a file in the format specified within this document for processing by the CRE. The CRE is a software application created by the Government and provided to law enforcement agencies as government furnished information (GFI). The CRE performs various business rule validations of the information contained in the Rapid CMF import file prior to enrolling the specimen in the CODIS database.

This specification contains the following information:

- **Rapid Import Format Summary –** summarizes the components, format, and data types of elements in the CODIS Rapid Import Common Message Format (CMF) file. The message is created using the Extensible Markup Language (XML) format.
- **Rapid Import Fields –** detailed description of the data elements contained in the Rapid Import CMF file. Rapid Import fields are described in detail to highlight expected data. A sample Rapid Import CMF file as well as the applicable schema are also included.
- **Appendix A – Example Rapid Import CMF file.**
- **Appendix B – Rapid CMF XSD File –** defines the valid XML structure for a CMF file using an XML schema definition (XSD) file.
- **Appendix C – Locus Information** – lists the currently delivered CODIS loci.
- **Appendix D – Specimen Category Information** – lists the currently delivered CODIS specimen categories that are approved for NDIS data acceptance when using a Rapid DNA instrument.
- **Appendix E – Kit Information** – lists the kits that are currently NDIS approved for data acceptance when using a Rapid DNA instrument.

Disclaimer: Please note that any commercial products mentioned in this document are for example purposes only and are not intended as an FBI endorsement of any rapid DNA instrument vendor or of any commercial products used to process DNA.

Requests for an electronic copy of this document and all schemas should be sent to RapidDNA@fbi.gov. Questions about communicating with the State Identification Bureau/State CJIS Systems Agency or booking agency system should be directed to the applicable state or local law enforcement agency.

2.0 SYSTEM CONCEPT

Collaboration is needed with implementers of booking agency systems and rapid DNA instruments to validate the technical feasibility of this interface specification. The CODIS application requires for Rapid CMF import files to pass validation performed by the CRE in order to enroll specimens in the CODIS database. Booking agency system vendors and rapid DNA instrument vendors must collaborate on technical approaches to confirming the identity of the arrestee being fingerprinted corresponds to the buccal swab being processed for DNA by the rapid DNA instrument. The term "arrestee" refers to the subject being processed for the purpose of enrollment in the CODIS database. The subject being processed could have any authorized CODIS specimen category (e.g. detainee, convicted offender, juvenile, legal, etc.).

The Government is providing this interface specification to guide the implementation of integration between rapid DNA instrument and the CRE. A separate interface specification document (*Arrestee Enrollment Format Interface Specification Document (AEF ISD)*) is available to facilitate integration between the booking agency systems and rapid DNA instruments. Rapid DNA instrument vendors can declare compliance to this FBI standard only if the Rapid Import CMF file generated by the device is compliant with the XML schema in Appendix B.

The Government encourages Industry to provide innovative solutions to collecting the fingerprints and the buccal swab while maintaining the integrity of the data such that no errors occur when tracing the buccal swab inserted into the rapid DNA instrument to the same person being fingerprinted.

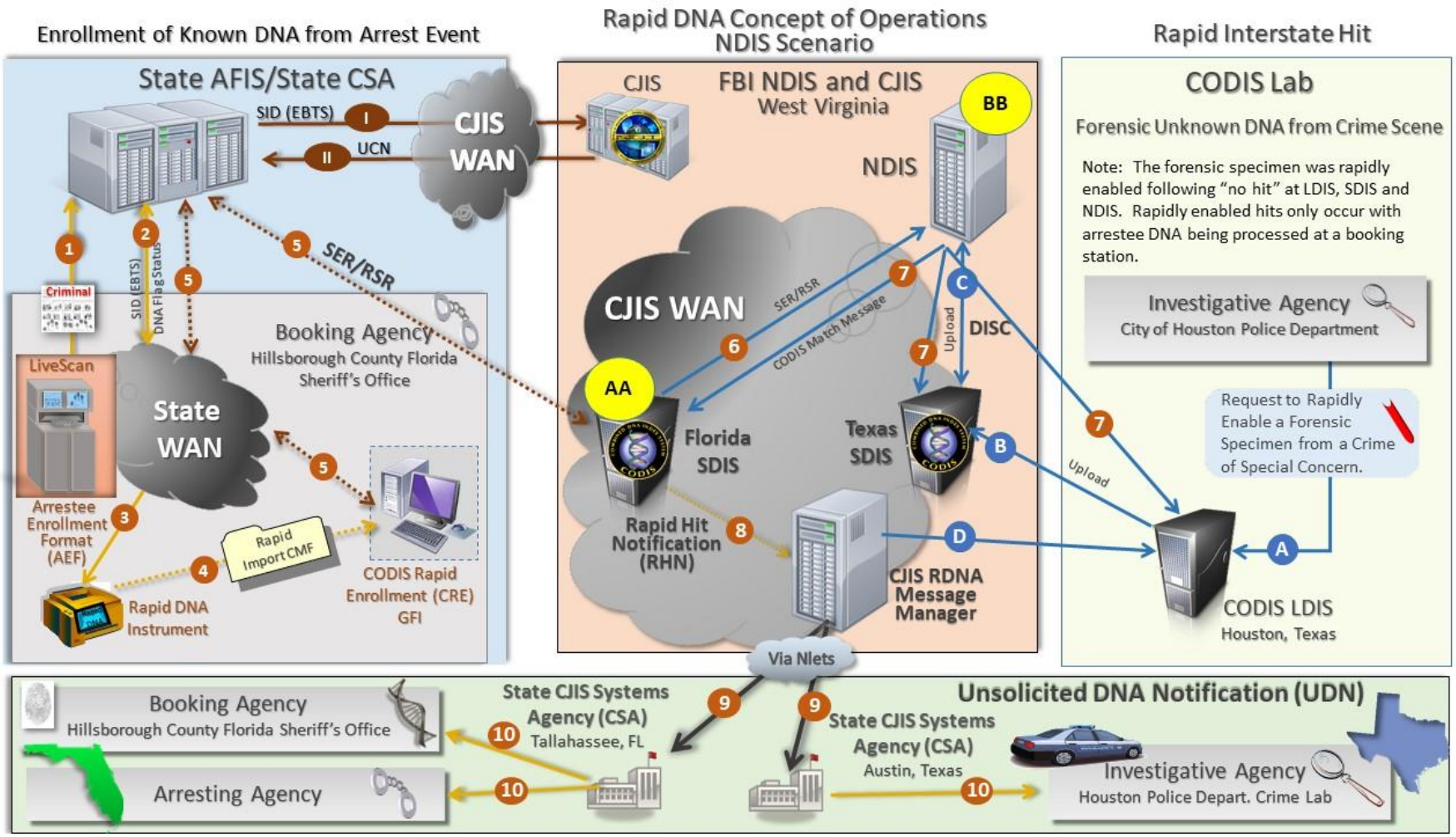

Figure 2-1 Rapid DNA Concept of Operations

Figure 2-1 Rapid DNA Concept of Operations depicts an example of the overall data exchange flow for processing an arrestee and enrolling the arrestee DNA sample in the CODIS database. This depiction also includes the searching of the arrestee profile and notifications to local law enforcement agencies.

- Arrow 1 – the arrestee is fingerprinted using a LiveScan device and the fingerprints are sent to the State Automated Fingerprint Identification System (AFIS) to determine if the arrestee is already enrolled or needs to be enrolled in the State AFIS
- Arrow I – the State AFIS sends the fingerprints to FBI Criminal Justice Information Services (CJIS) to determine if the arrestee is enrolled or needs to be enrolled
- Arrow II – FBI CJIS returns the FBI Universal Control Number (UCN) to the State AFIS
- Arrow 2 – the State AFIS returns the arrestee State Identification number (SID) and the system could indicate if DNA needs to be collected from the arrestee
- Arrow 3 – the booking agency IT system generates an AEF message for the Rapid DNA instrument
- Arrow 4 – the Rapid DNA instrument creates the Rapid Import CMF file in a directory accessible to the CODIS Rapid Enrollment (CRE) application
- Arrow 5 – the CRE application validates the information in the Rapid Import CMF file and sends a Search Enrollment Request (SER) and Rapid Search Request (RSR) message to the CODIS SDIS server via the State WAN that is connected to the CJIS WAN
- Action AA – the CODIS SDIS server searches the arrestee specimen against the DNA profiles in the state DNA index of special concern (DISC)
- Arrow 6 – the CODIS SDIS server validates the SER and RSR messages then sends the SER and RSR messages to the CODIS NDIS server
- Action BB – the CODIS NDIS server searches the arrestee specimen against the DNA profiles in the national DNA index of special concern (DISC)
- Arrow 7 – the NDIS server sends CODIS match messages to all of the CODIS labs involved in any matches to the arrestee profile
- Arrow 8 – the CODIS SDIS server that owns the arrestee profile sends a Rapid Hit Notification (RHN) message to the CJIS Message Manager (CMM) service via the CJIS WAN
- Arrow 9 – the CMM service sends Unsolicited DNA Notification (UDN) messages to the State CJIS Systems Agency (CSA) of the booking, arresting, and investigative agencies
- Arrow 10 – the State CSA sends the UDN messages to the local law enforcement booking, arresting, and investigative agencies
- Arrow A – the investigative agency requests that the CODIS LDIS change the status of the unsolved forensic profile to include in the DISC
- Arrow B – the CODIS LDIS uploads the unsolved forensic profile to CODIS SDIS DISC
- Arrow C – the CODIS SDIS uploads the unsolved forensic profile to CODIS NDIS DISC
- Arrow D – the CMM service forwards the RHN message to the CODIS LDIS that owns the unsolved forensic profile in the DISC

This interface specification is specific to data exchange between the rapid DNA instrument and the CRE as depicted by arrow 4 in Figure 2-1. See Figure 2-2 for a simplified depiction of the internal messaging data flows related to the booking agency system environment needed to enroll and search specimens in the CODIS database.

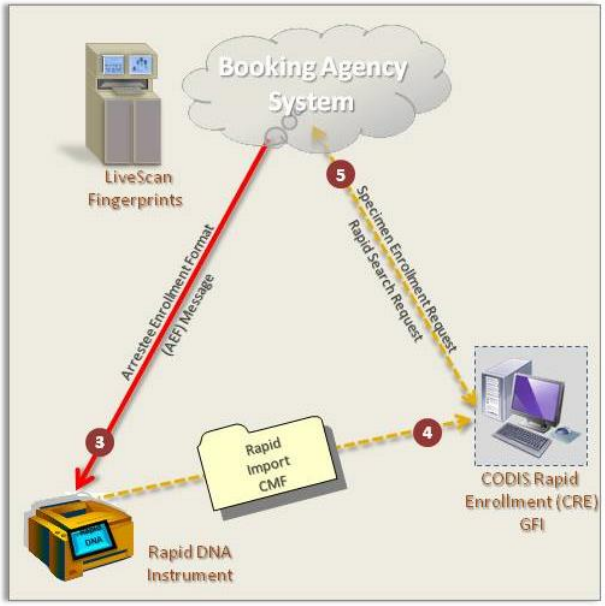

Figure 2-2 Booking Agency System Internal Message Flow

- Arrow 3 – the booking agency IT system generates an AEF message for the Rapid DNA instrument
- Arrow 4 – the Rapid DNA instrument creates the Rapid Import CMF file in a directory accessible to the CODIS Rapid Enrollment (CRE) application
- Arrow 5 – the CRE application validates the information in the Rapid Import CMF file and sends a Search Enrollment Request (SER) and Rapid Search Request (RSR) message to the CODIS SDIS server via the State WAN that is connected to the CJIS WAN

The term "booking agency system" is a generic abstraction of the IT system used in a booking or jail facility that processes arrestees by collecting fingerprints and enrolling the arrestee in the state AFIS and/or FBI NGI database. Multiple implementation approaches are possible to communicate between the booking agency system and the rapid DNA instrument. Rapid DNA instruments are expected to support network connectivity within the booking agency environment. The rapid DNA instrument is expected to generate rapid CMF import files that are saved to a user specified file directory via the booking agency network. This document is intended to define the message format and content necessary to allow metadata and the DNA profile from the arrestee to be enrolled in the CODIS database via the CRE application.

3.0 RAPID IMPORT FORMAT SUMMARY

The CODIS Interface Specification uses a Common Message Format (CMF) to enable the exchange of data between the Rapid DNA instrument and the CODIS Rapid Enrollment application. The CMF defines the packaging of information for enrollment into CODIS and is based on the XML industry standard. This industry standard is already in use by other CODIS functionality, and the format specific to Rapid Import CMF files is based on the format used for specimen imports and specimen enrollment requests.

A Rapid Import CMF message has the following general format:

Message Header
Device
Specimen1
Specimen2
•
•
•

Table 3-1 Rapid Import Format

The Message Header contains the following information:

- Message Version
- Message Type
- Message ID
- Message Date/Time
- Message Creator User ID
- Destination ORI
- Source ORI
- Alternate Source ORI – an Alternate Source ORI could be used when the booking agency is not the arresting agency

The Device has the following characteristics:

- Instrument ID
- Instrument Manufacturer
- Instrument Model
- Instrument Software Version

Specimens could have the following characteristics for enrollment in the CODIS database:

- CODIS Specimen ID
- CODIS Specimen Category
- State Identification Number (SID)
- Universal Control Number (UCN)
- Livescan Unique Event Identifier
- Booking Agency Configurable Identifier
- Arresting Agency Configurable Identifier
- Arrest Submission Date
- Fingerprint Capture Date and Time
- Arrest Offense Description
- Specimen Comment
- Loci

3.1 Data Types

Data types referred to in this document are defined by the World Wide Web Consortium (W3C).

Datetime: Represents a specific instance of time in a subset of the ISO 8601 format. The pattern for dateTime is CCYY-MM-DDThh:mm:ss where CC represents the century, YY the year, MM the month, and DD the day, preceded by an optional leading negative (-) character to indicate a negative number. If the negative character is omitted, positive (+) is assumed. The T is the date/time separator and hh, mm, and ss represent hour, minute, and second respectively. Additional digits can be used to increase the precision of fractional seconds if desired. For example, the format ss.ss... with any number of digits after the decimal point is supported. The fractional seconds' part is optional. CODIS does not support the use of time zones. All time should be reported using local time and no time zone should be specified.

Decimal: Represents arbitrary precision numbers.

Integer: Represents whole numbers without any fractional value.

String: Represents character strings. Character data consists of any combination of letters, symbols, and numeric characters.

Parsing Instructions: Certain characters in XML have a specific meaning to parsers, such as < and >. If any data in the file uses these special characters, a character reference string must be used for the parser to correctly interpret the character. The following table lists character reference strings:

Character Reference String	Resultant Character
&amp;	&
&gt;	>
&lt;	<
&apos;	‘
&quot;	“

Table 3-2 Character Reference Strings

3.2 Security

The establishment and enforcement of Information Technology (IT) and agency security policies is not the focus of this document. While this rapid DNA technology and the capabilities will be a great advantage to criminal justice personnel; it is creating a security management challenge. The small size, large storage capacity and network connectivity of these devices make unprotected rapid DNA instruments susceptible to loss, theft and misuse, and possibly a target for someone wanting unauthorized access to information or databases. As a result, unsecured instruments can pose a risk to any criminal justice network that the instrument can access. In order to adequately secure the instrument from misuse or attack and to meet regulatory standards and requirements, agencies must develop device security policies based on the implementation approach for communicating between the booking agency IT system and the rapid DNA instrument. These policies should include measures regarding authentication, data expungement, encryption, application launch controls and instrument feature disablement. Data sent from the booking agency system to the rapid DNA instrument must be securely transmitted to protect confidentiality and integrity regardless of the implementation approach. Please refer to *NIST Mobile ID Best Practices* and *CJIS Security Policy* (https://www.fbi.gov/about-us/cjis/cjis-security-policy-resource-center/view) for further security considerations.

Security updates to Rapid DNA devices should coincide with security policy changes or security software updates to booking agency systems.

3.2.1 Authentication and Authorization

The rapid DNA instrument should provide the capability for an operator to authenticate his/her identity as well as establishing authorization levels for that person based on a two-factor authentication, one of which should be a biometric.

The rapid DNA instrument should provide biometric operator authentication and a password of minimum length with alphabetical /numeric/special characters.

The rapid DNA instrument should provide the capability for operator re-authentication after a designated length of time.

The rapid DNA instrument should provide the capability for operator re-authentication and the instrument should re-authenticate itself after a designated amount of idle time or result in an instrument shut-off.

The rapid DNA instrument should provide the capability to lock the instrument or render the instrument inoperable, erase selective files, and/or erase all files on the instrument based on failed security protocols.

The rapid DNA instrument should provide the capability to establish a maximum limit of failed authentication attempts before the instrument requires unlock only by an IT administrator.

The data authentication algorithm used shall be RSA-2048 as defined by FIPS-186-3 2006 (DSS). The Secure Hash Function the signature will be evaluated over shall be SHA-256, as defined by FIPS-180-2. The provisioning of certificates, root certificates, and private keys shall remain outside the scope of this standard.

3.2.2 Data at Rest

The rapid DNA instrument shall at a minimum provide the capability to encrypt all data residing on the instrument either as a temporary file or a part of a database in a manner to meet the FIPS 140-2 Type-1 requirements. Such encryption software shall be FIPS 140-2 certified or equivalent.

3.3 File Format

The Rapid Import CMF file, coded in XML, contains information about the specimens to be enrolled in the CODIS database. This file consists of a CMF Header and one or more specimens structured in the format listed below. For readability in this document, the format shown below does not include the actual XML syntax. Tabs, carriage returns, and blanks may be inserted at the beginning or end of any line to improve readability. A carriage return and line feed character are at the end of each line in the Import CMF file to allow easy viewing in text editors such as Microsoft Notepad. Microsoft Internet Explorer can also be used to view import files. Comments may be included in the file following the XML comment syntax. No leading spaces are allowed in the comments field. See *Appendix A* for an example Rapid Import CMF file. *Appendix B* includes the XML Schema Definition (XSD) document used in interpreting and validating the XML file.

Message Header:
Message Version (1.0 decimal, required)
Message Type (Rapid Import, maximum 32 characters, required)
Message ID (integer, value greater than 0, required)
Message Date/Time (datetime, CCYY-MM-DDThh:mm:ss, required)
Message Creator User ID (maximum 20 characters, required)
Destination ORI (maximum 10 characters, required)
Source ORI (maximum 10 characters, required)
Alternate Source ORI (maximum 10 characters, optional)

Device:
Instrument ID (maximum 32 characters, required)
Instrument Manufacturer (maximum 32 characters, optional)
Instrument Model (maximum 32 characters, optional)
Instrument Software Version (maximum 32 characters, optional)

Specimen:
FOR each Specimen
    CODIS Specimen Identifier (maximum 24 characters, required)
    CODIS Specimen Category (maximum 32 characters, required)
    SID (maximum 32 characters, optional)
    UCN (maximum 9 characters, optional)
    Livescan Unique Event Identifier (maximum 32 characters, required)
    Booking Agency Configurable Identifier (maximum 32 characters, optional)
    Arresting Agency Configurable Identifier (maximum 32 characters, optional)
    Arrest Submission Date (datetime, CCYY-MM-DDThh:mm:ss, optional)
    Fingerprint Capture Date and Time (datetime, CCYY-MM-DDThh:mm:ss, required)
    Arrest Offense Description (maximum 300 characters, required)
    Specimen Comment (maximum 512 characters with no leading spaces, optional)
    FOR each Locus
        CODIS Locus Name (maximum 10 characters, required)
        Kit (maximum 32 characters, optional)
        Batch ID (maximum 32 characters, optional)
        FOR each Allele
            Allele Value (maximum 10 characters, required)
        ENDFOR
    ENDFOR
ENDFOR

4.0 RAPID IMPORT FIELDS

4.1 Field Descriptions

The following table describes both the required and optional fields used in Rapid Import CMF files.

Field	Description
Message Header Fields	
Message Version	Used to specify the version of the message being created. The currently valid message version is "1.0". As requirements change, newer versions/formats of the Rapid Import CMF will be used. This field is required.
Message Type	The only valid message type is “Rapid Import” when exporting specimens from the rapid DNA instrument to the CRE. This field is required.
Message ID	The message ID is a sequential integer value that is necessary for submission to the CRE to identify the file for internal diagnostics. Rapid DNA instrument vendors should increment this value by one each time a new Rapid Import CMF file is generated. The message ID is not stored in the CODIS database. This field is required.
Message Date/Time	The date/time for when the file was created by the rapid DNA instrument. This field is required.
Message Creator User ID	The user id of the person operating the rapid DNA instrument that generated this Rapid Import CMF file. This user is associated to the agency identified by the Source ORI. It is assumed that each operator of the rapid DNA instrument will be linked to a unique user ID at the source agency. This field is required.
Destination ORI	Originating Agency Identifier (ORI) for the destination booking agency that will operate the CRE and process the Rapid Import file. This ORI corresponds to the booking agency using a rapid DNA instrument to process a subject. Typically, the Source ORI and the Destination ORI are expected to be the same value since both the rapid DNA instrument and the CRE will be at the same agency. This field is required.
Source ORI	The ORI for the booking agency that is processing the arrestee. Typically, the Source ORI and the Destination ORI are expected to be the same value since both the rapid DNA instrument and the CRE will be located at the same agency that is processing the arrestee. This field is required.

Alternate Source ORI	The ORI for the arresting agency that needs to be notified if a CODIS hit occurs to a crime of special concern. During the booking process of the arrestee, the booking agency will need to identify if a different arresting agency needs to receive an unsolicited DNA notification (UDN) message. This field is optional. No value needs to be specified for this field for law enforcement agencies that do not routinely process arrestees for a different law enforcement agency. If the field is not specified, no UDN message needs to be sent to an arresting agency. The ORI specified for this field must be different than the destination ORI and the source ORI.
Device Fields	
Instrument ID	A unique identifier of the Rapid DNA Instrument used to process the specimens contained in the CMF file. This identifier could correspond to the serial number of the Rapid DNA instrument. This field is required.
Instrument Manufacturer	The manufacturer of the Rapid DNA Instrument used to process the specimens contained in the CMF file. This field is optional.
Instrument Model	The model of the Rapid DNA Instrument used to process the specimens contained in the CMF file. This field is optional.
Instrument Software Version	The version of the software installed on the Rapid DNA Instrument used to process the specimens contained in the CMF file. This field is optional.
Specimen Fields	
CODIS Specimen Identifier	An identifier for the specimen within the import file. Specimen identifiers must be unique within each CMF import file. Agencies need to coordinate with their State CODIS Administrator to determine how specimen IDs can be uniquely created for every agency within the state that is submitting DNA specimens for enrollment. This field is required.
CODIS Specimen Category	See Appendix D for valid specimen categories. Schema validation is case sensitive for specimen categories. This field is required.
SID	An identification number assigned to link fingerprints and criminal records of arrest and prosecution. Domestic law enforcement agencies are limited to a maximum of 10 characters. Law enforcement agencies operating outside of the United States (not participating in the FBI CODIS National DNA database) that are establishing a rapid DNA capability may use a SID value greater than 10 characters. This field is required for State and Local Arrestees and optional for Federal Arrestees. Without the SID, the rapid DNA instrument will not permit the DNA sample from the State and Local Arrestee to be processed.

UCN	A unique number assigned as a reference by the FBI Next Generation Identification (NGI) System to provide identity management which involves linking records from the civil, criminal and other new repositories. This field is required for Federal Arrestees and optional for State and Local Arrestees. Without the UCN, the rapid DNA instrument will not permit the DNA sample from the Federal Arrestee to be processed.
Livescan Unique Event Identifier	The purpose of the unique event identifier is to connect the arrest record created when fingerprints were taken to the DNA profile taken from the arrestee being processed. This value supports determining the qualifying offense for the arrest event that caused the DNA sample to be processed. This value is used to uniquely identify a specific enrollment event during fingerprint processing. This value is a primary key to tie the LiveScan arrest event generated by the submitting agency when enrolling in the state criminal history database. States may use different terms for this value that refers to the unique identifier used to link an arrestee to a specific enrollment event within their state AFIS. For example, the state of Louisiana uses the term "Arrestee Transaction Number (ATN)" for this value that links an arrestee to a fingerprint transaction within the state's computerized criminal history (CCH) repository. Law enforcement agencies participating in rapid DNA specimen enrollment will determine how this value should be populated. This field is required.
Booking Agency Configurable Identifier	An identifier used for specific booking agency purposes. Law enforcement booking agencies will determine if and how this value will be provided. For example, this field could be used to transmit a state specific transaction number or an identifier used to track arrestees within the local booking agency. This field could be used to link the arrestee to the local law enforcement agency biographic and biometric systems. This field is optional.
Arresting Agency Configurable Identifier	An identifier used for specific arresting agency purposes. Law enforcement arresting agencies will determine if and how this value will be provided. For example, this field could be used to record the arrest/incident number when an arrestee is booked by a different law enforcement agency. This field is optional.
Arrest Submission Date	The local date that a Subject was arrested, CCYY-MM-DDThh:mm:ss format. This field is optional.
Fingerprint Capture Date and Time	The local date and time that a Subject was processed for fingerprints in CCYY-MM-DDThh:mm:ss format. This field is required.

Arrest Offense Description	The text based description of the offense related to the cause of arrest/detention. This field is required.
Specimen Comment	Any comment that provides information regarding the specimen. This field is not intended for manual data entry. If needed, Rapid DNA instrument vendors can include extra information regarding the genetic analysis in this field. No leading spaces. This field is optional. If the field is not specified, specimens are inserted into the database without a comment.
Locus Field	
CODIS Locus Name	See Appendix C for valid Locus names. Locus names must be unique within each specimen. Schema validation is case sensitive for locus names. This field is required.
Kit	The kit that was used to produce the readings for the specimens in the CMF file. See Appendix E for a list of valid kits. This field is optional. If the field is not specified, loci will be inserted without a kit. It is not necessary to specify a kit for each locus if all of the loci in this import file were produced using the same kit.
Batch Identifier	An identifier for the batch to which the specimen belongs. The batch identifier could correspond to the cartridge ID used in the Rapid DNA instrument. This field is optional. If the field is not specified, loci will be inserted without a batch identifier.
Allele Field	
Allele Value	Contact the State CODIS Administrator where the arrestee specimen is being enrolled for a list of valid allele values for each locus. This field is required.

Table 4-1 Rapid Import Field Descriptions

4.2 Message Header Fields

The following table lists details for the fields in the Rapid Import message header. The XML Tag/Attribute column identifies the field within the XML Rapid Import file. The Cardinality column describes the minimum and maximum number of times each field can occur.

Field	Format	XML Tag/Attribute	Cardinality
Message Version	Decimal having 3 digits, one being fractional.	MESSAGEVERSION	(1,1)
Message Type	Up to 32 characters.	MESSAGETYPE	(1,1)
Message ID	Integer value greater than 0.	MESSAGEID	(1,1)
Message Date/Time	CCYY-MM-DDThh:mm:ss	MESSAGEDATETIME	(1,1)
Message Creator User ID	Up to 20 characters.	MSGCREATORUSERID	(1,1)
Destination ORI	Up to 10 characters.	DESTINATIONORI	(1,1)
Source ORI	Up to 10 characters.	SOURCEORI	(1,1)
Alternate Source ORI	Up to 10 characters.	ALTSOURCEORI	(0,1)

Table 4-2 Message Header Fields

4.3 Device Fields

The following table lists the fields defining the characteristics of the rapid DNA instrument that is generating the Rapid Import file.

Field	Format	XML Tag/Attribute	Cardinality
Instrument ID	Up to 32 characters.	INSTRUMENTID	(1,1)
Instrument Manufacturer	Up to 32 characters.	MANUFACTURER	(0,1)
Instrument Model	Up to 32 characters.	MODEL	(0,1)
Instrument Software Version	Up to 32 characters.	SOFTWAREVERSION	(0,1)

Table 4-3 Device Fields

4.4 Specimen Fields

The following table lists details for the fields defining a specimen. No limit exists for the number of specimens that can be within an import file. The Rapid import file is created by the rapid DNA instrument if the fingerprints for arrestees were successfully enrolled in the state identification bureau or the Federal Fingerprint File. All arrestees must have either a State Identification (SID) number or an FBI Universal Control Number (UCN). If neither the SID nor the UCN are provided for the arrestee specimen in the Rapid Import CMF file, then the CRE will create a report indicating that a validation error occurred and the DNA sample will not be enrolled in the CODIS database.

Field	Format	XML Tag/Attribute	Cardinality
CODIS Specimen Identifier	Up to 24 characters. Symbols allowed include the pound sign (#), single quote (‘), double quote (“), slash (/) and hyphen (-).	SPECIMENID	(1,1)
CODIS Specimen Category	Up to 32 characters.	SPECIMENCATEGORY	(1,1)
SID	Up to 32 characters.	SID	(0,1)
UCN	Up to 9 characters.	FBI_NUMBER_UCN	(0,1)
Livescan Unique Event Identifier	Up to 32 characters.	UNIQUEEVENTID	(1,1)
Booking Agency Configurable Identifier	Up to 32 characters.	BOOKINGCUSTOMID	(0,1)
Arresting Agency Configurable Identifier	Up to 32 characters.	ARRESTINGCUSTOMID	(0,1)
Arrest Submission Date	CCYY-MM-DDThh:mm:ss	ARRESTDATE	(0,1)
Fingerprint Capture Date and Time	CCYY-MM-DDThh:mm:ss	FINGERPRINTDATE	(1,1)
Arrest Offense Description	Up to 300 characters.	ARRESTOFFENSECATEGORY	(1,1)
Specimen Comment	Up to 512 characters.	SPECIMENCOMMENT	(0,1)

Table 4-4 Specimen Fields

4.5 Locus Fields

The following table lists the fields defining the characteristics of a locus. Specimens are limited to 32 STR loci and 32 Y-STR loci per specimen for a maximum of 64 loci.

Field	Format	XML Tag/Attribute	Cardinality
CODIS Locus Name	Up to 10 characters.	LOCUSNAME	(1,64)
Kit	Up to 32 characters.	KIT	(0,1)
Batch ID	Up to 32 characters.	BATCHID	(0,1)

Table 4-5 Locus Fields

4.6 Allele Fields

The following table lists the fields defining the characteristics of an allele. Loci are limited to 8 alleles per locus. However, all specimens being processed on a Rapid DNA Instrument for enrollment in the CODIS database are expected to be single source reference specimens. Specimens with more than 3 alleles at any locus will be rejected during validation by the CRE and the specimen will not be enrolled in the CODIS database.

Field	Format	XML Tag/Attribute	Cardinality
Allele Value	Up to 10 characters.	ALLELEVALUE	(1,8)

Table 4-6 Allele Fields

5.0 SPECIAL PROCESSING INSTRUCTIONS

Rapid DNA instrument vendors should adhere to following rules when generating the import CMF file:

1. Do not pad fields by adding extra characters or blank spaces to reach the maximum field length.
2. Do not add unnecessary whitespace when generating the file.
3. Do not include a time zone for date fields. Use local time for date fields.
4. Do not include unprintable characters within text fields.
5. Do not include empty elements. Optional elements with no value should be omitted from the file.

When providing allele values in the import CMF file, the following suggestions can improve performance of processing import files:

1. Allele values should avoid the necessity of off-ladder allele conversion by using only allele values defined within CODIS.
2. Duplicated homozygous alleles should be replaced by a single allele (*e.g.* 9) instead of two identical allele values (e.g. 9, 9).
3. Allele values for a STR genotype should be sorted according to the nomenclature defined by the Scientific Working Group on DNA Analysis Methods (SWGDAM). For example, <9, 9, 9.1, 9.2, 9.3, 10, >10.
4. Do not include unnecessary whitespace when creating allele values in the XML import file. For example, the allele value 10 should be represented as `<ALLELEVALUE>10</ALLELEVALUE>` rather than `<ALLELEVALUE>10 </ALLELEVALUE>`.

Note: Symbols such as < and > must be replaced by character reference strings before importing into CODIS. See String Data Types, section *3.1 Data Types*, for more information.

6.0 VALIDATION

The CRE application validates both the format of the Rapid CMF file and the data contained within the file. For development purposes, an XML Validator can also validate the format of the Rapid CMF file without having to install CODIS. Please email RapidDNA@fbi.gov for any questions related to Rapid CMF file validation.

Appendix A. Example Rapid CMF File

An example of a Rapid CMF file containing two specimens follows:

```
<?xml version="1.0" encoding="utf-8"?>
<CODISRapidImportFile xmlns="urn:CODISRapidImportFile-schema">
   <HEADER>
      <MESSAGEVERSION>1.0</MESSAGEVERSION>
      <MESSAGETYPE>Rapid Import</MESSAGETYPE>
      <MESSAGEID>1</MESSAGEID>
      <MESSAGEDATETIME>2016-07-21T22:26:13</MESSAGEDATETIME>
      <MSGCREATORUSERID>KEllis</MSGCREATORUSERID>
      <DESTINATIONORI>FL037010A</DESTINATIONORI>
      <SOURCEORI>FL037010A</SOURCEORI>
      <ALTSOURCEORI>FL037010B</ALTSOURCEORI>
   </HEADER>
   <DEVICE>
      <INSTRUMENTID>BIO_010</INSTRUMENTID>
      <MANUFACTURER>Net Bio</MANUFACTURER>
      <MODEL>Gen1</MODEL>
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led due to minumum peak threshold.</SPECIMENCOMMENT>
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Appendix B. Rapid CMF XSD File

The Rapid CMF XSD file used for validation follows:

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        targetNamespace="urn:CODISRapidImportFile-schema"
        elementFormDefault="qualified"
        xmlns:r="urn:CODISRapidImportFile-schema">
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" maxOccurs="1" />
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curs="1" />
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                  <field xpath="r:LOCUSNAME" />
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         <element name="MESSAGEDATETIME" type="rapid:CODISDate" minOccurs="1"
maxOccurs="1" />
         <element name="MSGCREATORUSERID" type="rapid:CODISUserIDType" minOccu
rs="1" maxOccurs="1" />
         <element name="DESTINATIONORI" type="rapid:CODISORIType" minOccurs="1
" maxOccurs="1" />
         <element name="SOURCEORI" type="rapid:CODISORIType" minOccurs="1" max
Occurs="1" />
         <element name="ALTSOURCEORI" type="rapid:CODISORIType" minOccurs="0"
maxOccurs="1" />
      </sequence>
   </complexType>
   <complexType name="DeviceType">
      <sequence id="SeqDevice" minOccurs="1" maxOccurs="1" >
         <element name="INSTRUMENTID" type="rapid:InstrumentIDType" minOccurs=
"1" maxOccurs="1" />
         <element name="MANUFACTURER" type="rapid:ManufacturerType" minOccurs=
"0" maxOccurs="1" />
         <element name="MODEL" type="rapid:ModelType" minOccurs="0" maxOccurs=
"1" />
         <element name="SOFTWAREVERSION" type="rapid:SoftwareVersionType" minO
ccurs="0" maxOccurs="1" />
      </sequence>
   </complexType>
   <complexType name="SpecimenType">
      <sequence id="SeqSpecimen" minOccurs="1">
         <element name="SPECIMENID" type="rapid:SpecimenIDType" minOccurs="1"
maxOccurs="1" />
         <element name="SPECIMENCATEGORY" type="rapid:SpecimenCategoryType" mi
nOccurs="1" maxOccurs="1" />
         <element name="SID" type="rapid:SIDType" minOccurs="0" maxOccurs="1"
/>
         <element name="FBI_NUMBER_UCN" type="rapid:FBINumberUCNType" minOccur
s="0" maxOccurs="1" />
         <element name="UNIQUEEVENTID" type="rapid:UniqueEventIDType" minOccur
s="1" maxOccurs="1" />
         <element name="BOOKINGCUSTOMID" type="rapid:CustomIDType" minOccurs="
0" maxOccurs="1" />
         <element name="ARRESTINGCUSTOMID" type="rapid:CustomIDType" minOccurs
="0" maxOccurs="1" />
         <element name="ARRESTDATE" type="rapid:CODISDate" minOccurs="0" maxOc
curs="1" />
```

```
         <element name="FINGERPRINTDATE" type="rapid:CODISDate" minOccurs="1"
maxOccurs="1" />
         <element name="ARRESTOFFENSECATEGORY" type="rapid:OffenseCategoryType
" minOccurs="1" maxOccurs="1" />
         <element name="SPECIMENCOMMENT" type="rapid:SpecimenCommentType" minO
ccurs="0" maxOccurs="1" />
         <element name="LOCUS" minOccurs="1" maxOccurs="64" >
            <complexType>
               <sequence id="SeqLocus" >
                  <element name="LOCUSNAME" type="rapid:LocusNameType" minOccu
rs="1" maxOccurs="1" />
                  <element name="KIT" type="rapid:KitType" minOccurs="0" maxOc
curs="1" />
                  <element name="BATCHID" type="rapid:BatchIDType" minOccurs="
0" maxOccurs="1" />
                  <element name="ALLELE" type="rapid:AlleleType" minOccurs="1"
 maxOccurs="8" />
               </sequence>
            </complexType>
         </element>
      </sequence>
   </complexType>
   <complexType name="AlleleType">
      <sequence id="SeqAllele" minOccurs="1" maxOccurs="1">
         <element name="ALLELEVALUE" type="rapid:AlleleValueType" minOccurs="1
" maxOccurs="1" />
      </sequence>
   </complexType>
</schema>
```

Appendix C. Valid STR/Y-STR Loci

The table below shows the currently delivered CODIS STR and Y-STR loci. Agencies using the CRE application have the ability to add other loci. Some of the loci listed below do not belong to the kits listed in Appendix E.

STR Locus Name	Y-STR Locus Name
Amelogenin	DYF387S1
CSF1PO	DYS19
D10S1248	DYS385
D12S391	DYS389 I
D13S317	DYS389 II
D16S539	DYS390
D18S51	DYS391
D19S433	DYS392
D1S1656	DYS393
D21S11	DYS437
D22S1045	DYS438
D2S1338	DYS439
D2S441	DYS448
D3S1358	DYS449
D5S818	DYS456
D6S1043	DYS458
D7S820	DYS460
D8S1179	DYS481
FGA	DYS518
Penta D	DYS533
Penta E	DYS549
SE33	DYS570
TH01	DYS576
TPOX	DYS627
vWA	DYS635
	DYS643
	YGATAH4
	Yindel

Appendix D. Valid Specimen Categories

The table below shows the currently delivered CODIS specimen categories that are intended for enrollment in CODIS using a rapid DNA instrument. Agencies using the CRE application have the ability to add other specimen categories.

Specimen Category
Arrestee
Convicted Offender
Detainee
Juvenile
Legal

Appendix E. Valid Rapid Instrument Kits

The table below shows the currently delivered CODIS kits for the CODIS Rapid Enrollment application. Please refer to the kit manufacturer for information on part numbers and catalog numbers. Agencies using the CRE application have the ability to add other kits.

CODIS Kit Name
FlexPlex27
GlobalFiler Express