Automated Fingerprint Identification Systems – National Database

Court Aide Memoire

Synopsis

This document is to aid Forensic Identification Services employees in explaining terms and processes in use while accessing or using the National Fingerprint/Palmprint Databases, for the purposes of helping the court understand how prints are collected and then used for search against crime scene/unknown prints. This document has been put together by Royal Canadian Mounted Police (RCMP) Forensic Identification Specialists, and experts in the operations of the Automated Fingerprint Identification System (AFIS) system, at the Canadian Criminal Real Time Identification Services (CCRTIS), Ottawa.

Introducing Prints to the National Database

Fingerprints and palmprints collected under the Legislative Authorities such as the Identification of Criminals Act, or Immigration Refugee Citizenship Canada Legislation, are submitted to the National Database in Ottawa, for search only, or search and retention.

Prints can be submitted in two ways to the National Database housed by the RCMP.

LIVESCAN

      a.   These devices capture the rolled and/or plain images of fingers/palms being placed in contact with a glass platen.
      b.   Plain fingerprints and palmprints are captured as single images
      c.   Rolled fingerprints are captured as a number of images stitched together electronically, as the finger is rolled across the glass platen.
      d.   The employee using the device enters the biographical information manually, or it is transferred via a record management system.

CARDSCAN

      a.   In situations where a Livescan is not available, a set of impressions using ink and a paper C-216 fingerprint form can be completed.
      b.   The impressions on paper are then scanned in using a flatbed scanner and a computer.
      c.   The employee enters the biographical information separately (or it is scanned in or transferred via a record management system).
      d.   The entire C-216 is not scanned as a complete image.

Both of these submission types are sent in National Institute of Standards and Technology (NIST) formatted packets, and are received in Ottawa. These packets are tagged with identifying numbers:

TCN   Transaction Control Number

DCN   Document Control Number

The DCN permits a user to track down how and when the prints were submitted to the National Fingerprint Database, the reason for submission, and submitting agency.

Processing and Searching in the National Database

Each AFIS is unique in that the programs are proprietary to the company that creates them. The overall algorithm creation and searching systems are secret to the design of the systems. In general terms, below is how the systems behave overall.

Processing

When fingerprints, palmprints, and photos are submitted to AFIS, the system uses a proprietary algorithm to analyze what is visualized in the friction ridge details (ridges and ridge flow, along with specific friction ridge minutiae.) The algorithm creates a value or key, for each print saved, and is often referred to as encoding. AFIS only retains the friction ridge detail and limited data to help narrow searches such as Date of Birth and Sex. This entry is linked to a separate database containing the associated biographical and criminal record information.

Searching

When a new set of prints is submitted to AFIS, or a latent print is searched, they must be encoded first. This is usually done automatically for sets of prints such as Criminal or Immigration submissions, or can be done manually in latent searches. The encoding creates an algorithm value/key that is then searched against the database.

For ten print submissions, because the system is searching a set of prints, the process is by and large lights out, and are automatically added to the database.

Latent impressions, because of the state of the impression, usually lacking a full recorded finger/palm, and the pressure or distortion issues, are compared manually by an AFIS technician, after the system returns a list of possible candidates.

Types of Ten-Print Submissions Relevant for Latent Searches

CAR-N

- Criminal Answer Required – Non Retain
- These prints are submitted normally to confirm identity of someone in lawful custody
- They are stored on the network for 120 days and then deleted
- They are searched against the Unidentified Latent Database in Reverse Search

CAR-Y

- Criminal Answer Required – Retain Yes
- Fingerprints/Palmprints submitted to accompany charges related to relevant Acts of Parliament
- They are either attached as a new submission to a Criminal Record, or used to create a new one
- They are searched against the Unidentified Latent Database in Reverse Search

IMM

- Immigration Prints
- Are submissions that accompany VISA, Temporary Resident, or other Immigration transactions
- These prints belong to Immigration, Refugees and Citizenship Canada (IRCC) and the Canada Border Services Agency (CBSA), and are held on the National Database
- Are held on the system until the person becomes a Canadian Citizen
- Are available for forward searching against new latent submissions

REF

- Refugee prints submitted under the Immigration and Refugee Protection Act (IRPA)
- Are submitted by CBSA and are held on the National Database
- Are held on the system until the person becomes a Canadian Citizen
- Are available for forward and reverse searches against the latent database

Criminal Justice Information Management (CJIM)

This electronic system permits courts and police services to enter criminal charge information and dispositions for a person. The system links the criminal record information, biographical information, and fingerprints/palmprints.

CJIM will also handle pardons, partial purges, and record suspensions, applying legislative rules to the visibility of fingerprints on the National Database for searching.

In addition to CJIM, the CCRTIS also has a Criminal Records Analysis Services unit that is responsible for overseeing record information, ensuring that only information adhering to the Identification of Criminals Act, or other relevant Acts, are accessible to police for searching.

Retrieval of Prints from the National Database

Prints can be requested from the system based on a FPS number, or a specific DCN if there are multiple sets of prints on file for an individual in the case of Central Latent Clients (CLC). The Handling (Fingerprint) Image (Retrieval) Request (HIRQ) tasks the National Database server to create a NIST packet with the fingerprint/palm-print images as requested, and other details such as the DCN number, name and date of birth of the subject. However, the name of the person taking the prints is not included. These packet images and information then populate a pre-formatted form for printing purposes if required.

The form is not an official C-216 fingerprint form, and is only used to view and compare prints. The purpose of these prints are to eliminate or identify a person to a crime scene/unknown print, and to assist in providing reasonable and probable grounds to arrest and obtain a set of prints that can be printed on an official C-216 form, in relation to the offence.

FAQ's

Q1: I can't find a particular set of prints that I know were taken of a subject that I need to compare against. Why can't I see them on the system?

A1: Most often, prints not visible are part of a record suspension, pardon, or purge of information, as mandated by applicable legislation. In some cases, there may be a delay of prints being submitted by an agency to the National Database. In those situations, contact the agency responsible for fingerprinting the person of interest.

Q2: What situations can I use a latent search, other than for crime scene submissions?

A2: Latent searches can only be used for crime scene prints, and for identity purposes of deceased or amnesia victims. They cannot be used for confirmation of identity of persons in custody. In those situations, a LiveScan or CardScan device must be used to submit a CAR-N search transaction. Section 6.2 of the Identification of Criminals Act refers specifically to pardon or discharge information that would otherwise not be releasable:

> *6.2 Notwithstanding sections 6 and 6.1 the name, date of birth and last known address of a person who has received a pardon or a discharge referred to in section 6.1 may be disclosed to a police force if a fingerprint, identified as that of the person, is found*
> > *(a) at the scene of a crime during an investigation of the crime; or*
> > *(b) during an attempt to identify a deceased person or a person suffering from amnesia.*

Q3: I found a print that has a blurriness or stitching issue, what can I do?

A3: LiveScan fingerprint images, specifically the rolled prints, may have blurriness or stitching issues in much the same way that inked impressions would have smudging issues. In these cases, you can obtain another set of prints from the National Database if available, or use the plain (flat) impressions for comparison. You should also compare the plain to the rolled impression as a best practice in these cases.

Q4: I need to find out who submitted a set of fingerprints to the National Database, how do I do that?

A4: The agency and date of fingerprinting can be found when browsing the list of DCN's for a particular FPS number. This information can then be used to make inquiries with that agency to determine who took or submitted the prints. For CardScan submissions, agencies will keep the hard copy of the C-216 form on file. For LiveScan submissions, packet information with the user ID of who submitted the prints, can be obtained if necessary by making a request through the Canadian Police Services Information Centre (CPSIC).

Q5: What is the resolution of prints stored on the database?

A5: Ten Print and Palm images are stored at 500 Pixels Per Inch (PPI)

Crime Scene/Unknown prints are stored at 1000 PPI

Glossary of Terms

CAR-N	Criminal (Ten Print Submission) Answer Required – Non Retain
CAR-Y	Criminal (Ten Print Submission) Answer Required – Retain Yes
CBSA	Canada Border Services Agency
CCRTIS	Canadian Criminal Identification Services
CLC	Central Latent Client – submission tool for Latent Images, and Ten Print Fetches
CPSIC	Canadian Police Services Information Centre
CRAS	Criminal Records Analysis Services
DCN	Document Control Number – unique to each set of Ten-Prints received
EFCD	Electronic Fingerprint Capture Device – LiveScan
Forward Search	The searching of a Latent print against the Ten Print Databases
FPS	Fingerprint Section Number (Criminal)
HIRQ	Handling (Fingerprint) Image (retrieval) Request
ICA	Identification of Criminals Act
IRCC	Immigration Refugee and Citizenship Canada (Federal Department)
IRQ	(Fingerprint) Image (retrieval) Request
National Database	Refers to the National Fingerprint and Palmprint Database, held in Ottawa ON
NIST	National Institute of Standards and Technology
PPI	Pixels Per Inch
Reverse Search	New incoming Ten Print Submissions are searched against the ULF (latent) prints
RNSC	Remote Network Search Coordinator
Subject Identifier	Unique number generated that identifies a person to at least one set of prints
ULF	Unsolved Latent File (Database)