



**TECHNICAL ADVISORY GROUP ON MACHINE READABLE  
TRAVEL DOCUMENTS (TAG/MRTD)**

**TWENTIETH MEETING**

**Montréal, 7 to 9 September 2011**

**Agenda Item 2: Activities of the NTWG**

**Agenda Item 2.14: Td1 Cards: Placement of Essential Information**

**TD1 CARDS: PLACEMENT OF ESSENTIAL INFORMATION**

(Presented by NTWG)

**1. INTRODUCTION**

1.1 In the late 1970s, ICAO developed international standards for reading passports and other travel documents. These standards were incorporated into Doc 9303, which is comprised of three parts. In Part 3, the standards were set out for “Machine Readable Official Travel Documents,” which have a td1 (85.6 x 53.98 mm) or td2 format (105.0 x 74.0 mm).

1.2 The td1 format has approximately the same size as a credit card and is therefore more convenient for citizens to carry or to keep in a wallet. Wallets and billfolds are designed to hold these sizes of documents.

1.3 In the 1980s and the 1990s a few States considered changing their Identity Cards from a non-compliant ICAO model or td2 format into a td1 format. Therefore, Identity Cards with a td1 format were hardly used as travel documents and were not seen much at border crossing points. These days more States are changing the format of their Identity Cards to the td1 format, which also serves as a travel document.

1.4 Border Control Authorities, Airport Authorities and Airlines are increasingly using (e)-readers to facilitate their inspection processes. In operational processes and during trials, it has been proven that the current design of the td1 format travel document has an impact on reading these documents automatically.

1.5 This working paper informs the members of the TAG about a solution for the e-td1 format cards.

## 2. CURRENT SITUATION

2.1 Since the late 1990s more States have changed their Identity Cards from a non-ICAO format or a td2 format into a td1 format.

2.2 Some States have also included a contactless chip in the identity card to be compliant with ICAO e-passports standards. For example, in the European Union 18 States have already issued td1 format Identity Cards to their citizens. Inclusion of the contactless chip according to ICAO specifications into the Identity Card is also a recommendation of the European Union. Therefore, a distinction can be made between Identity Cards and e-Identity Cards, both of which are ICAO compliant.

2.3 Border Control Authorities have been equipping their processes with (e)-readers in order to be able to read these travel documents. Additionally, more Airport Authorities and Airlines are using (e)-readers in their self-service kiosks to facilitate passengers to speed up the check-in and the control process.

## 3. NO SYNERGY IN READING PROCESS

3.1 A comparison of the reading process of the different ICAO compliant travel and identity documents shows that the MRP with the td3 format (125.0 x 88.0 mm) and the Identity Card with the td2 format allow the biographical and document data to be read from one side of the document.

3.2 Due to the size of the td1 format document, the design had to be adjusted in the past to facilitate the machine readability. To achieve the same result with the td1 document, the back side has to be read first for the Machine Readable Zone (MRZ) and then the front side of the card, to read the biographical data from the bearer.

3.3 When checking a td1 size card, the border control officer has to read the back side of the card first for the MRZ information to send the data to databases/watch lists or to be able to open the chip which uses BAC. The card has then to be removed from the reader and turned to allow reading of the front side of the card to collect the complete biographical profile of the bearer and the necessary document related information.

3.4 This is a time-consuming process, especially in an operational environment such as at airports, seaports or land borders. This is also the case for passengers who use the td1 format cards at self-service kiosks for check-ins. The fact that the card has to be turned in the reading process leads to practical problems. It is difficult to explain to passengers the order of doing things or how to extract the card from the reading device.

3.5 With the introduction of the e-component to the td1 format, it became more evident that the design of the card will lead to the above mentioned issues, since the MRZ is necessary to open the chip.

3.6 All td1 cards, whether containing a chip or not, face the same issues in an automated environment.

#### 4. **FIRST STUDY**

4.1 A sub-group of the New Technologies Working Group has already conducted a first study of this issue and devised a number of new proposals, which have been presented to TAG-MRTD/18.

4.2 These were associated with repositioning a part of or the whole MRZ to the front of the td1 card where also the most important biographical data was positioned for the use of dedicated (already existing) equipment.

4.3 Several options have been put forward in a Technical Report entitled *td1, replacement of essential information*, which is attached to this working paper.

#### 5. **SUGGESTED APPROACH**

5.1 The first set of options had some drawbacks and, with the approval of the members of the TAG, further research to devise an acceptable solution was conducted. This made it clear that it was necessary to make a distinction between non e-cards and e-cards.

5.2 The proposed solution for the non e-cards lies in the reproduction of the MRZ into another medium on the front of the card, for example, a barcode. The benefit is that the representation is much smaller than a MRZ and can be easily integrated into the design of the non e-card. An important condition that has been fulfilled is that the barcode could be easily read by readers currently in use. Therefore, the specifications have to be adapted to put this medium into one of the existing zones.

5.3 The proposed solution for the e-cards is based on a new technology called PACE (Password Authenticated Connection Establishment). PACE is the proposed successor to BAC. A 6-digit code is printed on the front side of the card in OCR- B font. The reader is able to read the 6-digit code. Once the code is read, a protocol will start to open the chip and access the information stored on the chip, like the MRZ and an image of the photograph of the bearer of the travel document. This means that there is no requirement to move the position of the MRZ from the back of the card.

#### 6. **SOLUTION**

6.1 At the NTWG meeting in Bangkok in March 2010, it was decided that there will be different solutions for non-chip and chip enabled identity cards.

6.2 The general preference was to start first with a solution for chip-enabled identity cards since a number of countries were already in the process of introducing ICAO compliant e-td1 cards. The group decided to look into a solution for non-chip enabled td1 cards at a later stage.

6.3 For the chip-enabled td1 cards the group came to a common decision. The solution for the chip-enabled td1 sized MRtds was to use the Card Access Number (CAN) as defined in paragraph 5.4 in this working paper, and in the Technical Report, "Supplemental Access Control for Machine Readable Travel Documents," Version 1.01 November 11, 2010.

7. **ACTION BY THE TAG**

7.1 The NTWG requests the TAG/MRTD to:

- a) take note of the work that has be done to date on the technical report follow up research;
- b) recognize the importance of reading non e-Identity documents and e-Identity documents at the border in an efficient and non-intrusive way by border officials or the passengers themselves at a self-service kiosk;
- c) agree with the decision to postpone the solution for the non-chip enabled chip td1 cards; and
- d) Agree with the solution for chip-enabled td 1 cards to specify a Card Access Number (CAN) on the front side of the td1 card according to the specification laid down in the Technical Report, "Supplemental Access Control for Machine Readable Travel Documents," Version 1.01 November 11, 2010.

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# MACHINE READABLE TRAVEL DOCUMENTS



## TECHNICAL REPORT

### *Machine Reading Options for td1 size MRtds*

Version – 1.0

Date - April 7, 2011

*Published by authority of the Secretary General*

**ICAO/NTWG SUB-WORKING GROUP FOR NEW SPECIFICATIONS td1 CARD**

File : Machine Reading Options for td1 size MRtds

Author : ICAO/NTWG Sub-Working Group for new specifications td1 Card

# Technical Report

## Machine Reading Options for td1 size MRtds

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### Release Control

Release	Date	Description
0.1	12-12-2007	First draft discussed in The Hague, December 12 2007
0.2	21-12-2007	Additions in chapter 2 by Uwe Seidel and chapter 3 by Tom Kinneging
0.3	18-01-2008	Results from Haarlem meeting (Jan 16) incorporated
0.4	22-01-2008	Adding an alternative proposal (by Uwe Seidel) Adding zone examples and personalised design examples (by Uwe Seidel)
0.41	01-02-2008	Discussion version for NTWG - Christchurch meeting
0.45	30-04-2008	Inclusion of Introduction and sample ID card Italy (by Sjeff Broekhaar)
0.65	24-02-2011	Revision of the TR based on the decision of TAG 19 and the discussion during the NTWG meeting in Bangkok by Sjeff Broekhaar
0.70	09-03-2011	Processed comments from Uwe Seidel on v 0.65
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0.95	31-03-2011	Editorial comments from Tom Kinneging and Uwe Seidel on v 0.85
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0.99	06-04-2011	Editorial review
1.0	07-04-2011	Finalized TR after consultation and approval of the TR editorial group

Technical Report editorial group		
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### 1. Introduction

#### 1.1 Background

Sometimes it is necessary to reconsider decisions taken in the past. At that time they may have been appropriate. But over the years the environment can change, resulting in a need for reconsideration.

In the 1980s ICAO published Part 3 of Doc 9303. In Part 3 the standards are set out for "Machine Readable Official Travel Documents", which have a td1 (85.6 x 53.98 mm) or a td2 format (105.0 x 74.0 mm).

The td1 format is approximately the same size as a credit card and is therefore more convenient for citizens to carry in a wallet. For many years wallets and billfolds were designed to hold this size of documents.

In the 80's and the 90's few States considered changing their Identity (ID) Cards from a non-compliant ICAO model or td2 format into a td1 format. Consequently ID Cards with a td1 format were rarely used as travel documents and not often seen at border crossing points.

Since the late 90's more States have changed their ID Cards from a non-ICAO format or a td2 format into an ICAO compliant td1 format. Some States also include a contactless chip in the ID Card to be compatible with Doc 9303, Part 3, Volume 2. For example, in the European Union 16 States already issue a td1 format ID Card to their citizens. Inclusion of the contactless chip, according to ICAO specifications, into the Identity card is also a recommendation in the European Union.

As a result more Border Control Authorities are using (e)-readers in order to be able to read those travel documents. More Airport Authorities and Airlines also use (e)-readers in their self-service kiosks to speed up passenger check-in and the control process.

When dealing with a td1 size card, the border control officer first has to read the Machine Readable Zone (MRZ) on the rear side of the card to create a travel record and conduct watch list searches. The card then has to be removed from the reader and turned to allow reading of the front side to collect the complete biographical profile of the bearer, including the photograph and the necessary document-related information.

This is a time-consuming process, in a busy operational environment at an airport, seaport or land border. This is also the case for passengers who use the td1 format card in a self-service kiosk for check-in. The fact that the card has to be turned in the reading process leads to practical problems. It is difficult to explain to passengers what the required order of doing things is or how to extract the card from the reading device.

With the introduction of the e-component to the td1 card it became clear that the design of the card will lead to the above-mentioned issues, since the MRZ information is needed to get access to the data on the chip.

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Three inter-linked areas therefore need to be taken into consideration for any redesign of the td1 card.

1. The design of the td1 card
2. The evolution of the use of the td1 card
3. The increasing use of the automated processing of travel documents

Regarding point 1. In comparing the reading process of the different ICAO compliant travel and identity documents, the MRP with the td3 format (125.0 x 88.0 mm) and the ID Card with the td2 format allow the biographical and document data to be read from one side (front) of the document and collect all data at once.

To achieve the same result with the td1 document, first the rear side has to be read and then the front side of the card, to gather the biographical data of the bearer, including the photo. Because of the size of the td1 format document, the design and lack of space had to be adjusted in the past to facilitate machine readability. This technical report will examine this challenge and come up with some alternatives.

Point two relates to efficiency and availability. A credit card size card is easier to handle in various applications with all current systems prepared to accept td1 size cards. Wallets and billfolds are already designed to fit this document size, so it was a logical decision of many governments to go with this format.

We need to look at more than just the card. Point three gives us the opportunity to also look at the machines assisting this process. This technical report will examine the possibility of changing the equipment and the automated reading process if necessary.

Several States are currently in the process of designing (new) national electronic identity cards. These cards may feature ICAO-compliant RF chips, as well as national applications for e-commerce and e-government purposes. New cards are expected to be td1-size machine readable travel documents in the majority of the cases.

Design, integration of security features, integration of chip technology and efficient operational use are of paramount importance in the card design to maintain high security and operational standards. For this reason, States feel the need to investigate all possibilities to bring physical and digital security features in line with a seamless and fast machine-assisted inspection process.

At the same time, traveler facilitation in the form of Automated Border Crossing (ABC) initiatives, will result in the handling of the travel document by the traveler him- or herself.

The NTWG, in its meeting in Singapore in September 2007, recognized that machine reading of td1 sized cards in situations where the MRZ as well as visual information and security features are of interest to the border control process, might necessitate automated inspection of both sides of the card. On ICAO compliant td1-size cards, the MRZ is situated on the rear side while the other information and most security features are on the front side. Reading data from the MRZ and information from the front side requires flipping the card, which, especially in an automated environment, can easily cause handling problems.

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It was decided at the NTWG meeting to investigate how to overcome the recognized difficulties in handling the card during the inspection process. The sub working group was tasked to come up with new solutions.

#### 1.2 Operational Experiences

During a trial at Schiphol Airport in Amsterdam between 18 June 2007 and 13 November 2007, where the td1 ID Cards were used in a self-service environment, the following points were observed:

- The td1 card was presented 180 degrees out of alignment with the self-service receptacle.
- The td1 card was presented the wrong side up (there are 7 potentially incorrect ways to present the td1 card).

Turning the td1 card on the scanner created the following problems:

- Due to the limited space for the hand under the top plate of the scanner, the user could not see what was happening under the plate.
- As the physical construction of an ID card is synthetic and flat, a user with short finger nails had difficulties removing the card from the scanner or turning the card.
- An automated match between the front and rear side of the ID card was not possible, causing the card to be automatically rejected. As a result, the information was correctly displayed on the screen but, as there was no mechanism to verify whether the front and rear of the card belonged together, the system rejected the card as authentication could not be guaranteed. Consequently, immigration officers had to undertake manual checks, adding unnecessary time to the overall control process.

One of the conclusions of the project team was that if the ID card and terminal could be configured, so that only one side of the card is read, the number of failures would be substantially reduced.

#### 1.3 Assumptions

It is assumed that the reader is familiar with the contents of [R2], ICAO Doc 9303, Part 3, Volume 1 "Machine Readable Official Travel Documents", Third Edition, 2008.

#### 1.4 Terminology

##### 1.4.1 Technical report terminology

The key words "MUST", "SHALL", "REQUIRED", "SHOULD", "RECOMMENDED", and "MAY" in this document are to be interpreted as described in [R1], RFC 2119, S. Bradner, "Key Words for Use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

In case OPTIONAL features are implemented, they MUST be implemented as described in this Technical Report.

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## 2. Overview

During the inspection process of a (e-) MRTD, of td 1 size, border control authorities want to check and compare the contents as well as the authenticity (including security features) of the:

- machine readable zone (MRZ)
- visual zone (VIZ)
- RF-chip (if present).

This has to be achieved without turning the (e-) MRTD, of a td 1 size, over to access:

- i) the VIZ and various security features at the front side of the card
- ii) the 3-line MRZ on the back of the card.

The inspection process, taking into consideration a future self-service or semi-automated procedure, should be generic for td1, td2 and td3 size MR travel documents. In other words if the turning of a data page is not required for a MRP process, it should not be necessary for td1-sized cards either. This is of particular importance since not only inspectors, but also airlines, airport operators and passengers themselves will use MR travel documents as the only token for border control, check-in and boarding.

From a security point of view, border control authorities indicated that they would rather ‘lift’ the personal information of the bearer from the secured front surface of a td1 card than from the more or less unprotected MRZ on the back of the card, even if this results in OCR errors. To overcome this problem, issuing authorities might consider:

- Protecting the back of the card by using advanced security features without obstructing OCR readability.
- Placing machine readable information on the front side of the card as well, as suggested in this Technical Report.

ICAO Doc 9303 standard layouts specify the data page size of MRTDs and the position of the MRZ as follows:

Data page dimensions and position of the MRZ vs. position of photo & VIZ

ICAO Doc 9303	Data page nominal dimensions	VIZ & Photo Position	MRZ Position
<b>Part 1</b> <i>Machine Readable Passports, Vol.1</i> <i>Passports with Machine Readable Data Stored in Optical Character Recognition Format</i>	ID-3 size according to ISO/IEC 7810: 88.0 mm × 125.0 mm	Front Side	Front Side – 2 line MRZ
<b>Part 2</b>	<b>MRV-A:</b>	Front Side	Front Side – 2 line

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<i>Machine Readable Visas</i>	80.0 mm × 120.0 mm <b>MRV-B:</b> 74.0 mm × 105.0 mm		MRZ
<b>Part 3</b> <i>Machine Readable Official Travel Documents, Vol.1 Official Travel Documents with machine readable data stored in Optical Character Recognition Format</i>	Size-1 MRTD (td1): 53.98 mm × 85.60 mm Size-2 MRTD (td2): 74.0 mm × 105.0 mm	Front Side	<b>td1:</b> Rear Side – 3 line MRZ <b>td2:</b> Front Side – 2 line MRZ

As can be seen from the table above, only for td1-size documents the information of the VIZ, the photo and the MRZ are on different sides of the document, resulting in a need to turn the document in a complete inspection process. This is unique for this document category and is not in line with the handling of all other ICAO Doc 9303 compliant MRTDs.







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globally inter-operable. Below is an example of a PDF 417 barcode printed on the front side of the td1 card? The 2D barcode can have different shapes.

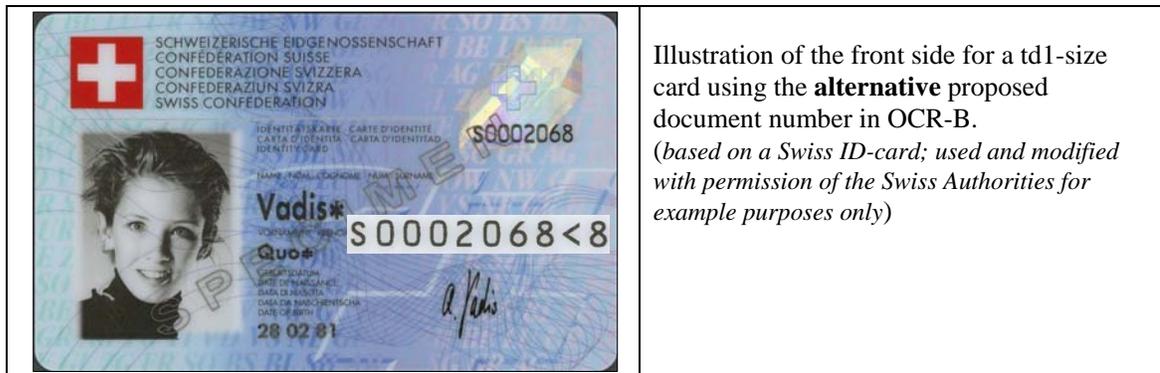


Beside the PDF 417 2D barcode there are other 2D barcodes which could be possible solutions. Two are shown below.



### 3.1.5 Option 5: Document number in OCR-B in visual zone at the front side of the card

This solution offers the possibility of making an automated connection between the scanned front and rear side of the card. The rear side already contains the number in the MRZ. Now the two sides can be linked in a travel record. Shown is a manipulated example of the document number in OCR-B at the front side of the Swiss Identity Card.





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#### 3.1.7 Option 7: Adjust reader equipment

The last solution considered is the technique used for example in an ATM machine. The card has to be inserted in a dedicated slot and this will make it possible to read a card from both sides at the same time. This could be a solution for future reader equipment.



#### 3.2 Prerequisites

The recommended options are based on the pros and cons table below and the following prerequisites:

- To minimize the risk of reader incompatibility, the solution must be based on OCR-B.
- MRTDs supporting the solution MUST have a Document Number of 9 digits + 1 check digit.
- The solution needs to be backwards compatible; as a consequence the 3-line MRZ as specified in ICAO Doc9303, part 3, remains MANDATORY.
- Solutions need to support one-side-reading of both chip- and non-chip enabled MRTDs.

#### 3.3 Pros and Cons of Options

The following table lists the options and their pros and cons with respect to the inspection process requirements. In this list there is no distinction made between solutions for non-chip enabled MRTDs and chip-enabled MRTDs.

Nr.	Option	Pro	Con
1.	3-line MRZ on the front	No flipping of the card for chip and non-chip MRTDs.	Not enough space available on the front of the card.
		Contains all data necessary to create travel records, check document number and execute background checks.	Visual zone fonts would need to become too small, impact on size photograph. Picture would need to become too small.
		Contains all data necessary for	

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		document background checks.	
		Contains the necessary fields in the MRZ to execute BAC.	Less space for security features.
2.	<b>1-line MRZ at the front - accent use name query</b>	Takes less space than 3-line MRZ.	Reduced space front side card. Requires zone shifting.
		Contains (limited) data for person background checks.	Might not contain enough data for full background checks.
		Contains the necessary fields in the MRZ to execute BAC.	Software change for readers.
		9 characters document number always present.	
3.	<b>1-line MRZ at the front – accent use document search</b>	Contains sufficient data for document background checks.	Requires zone shifting.
		Contains the necessary fields in the MRZ to execute BAC.	Software change for readers.
4.	<b>2D Barcode on front side</b>	All data from the 3 line MRZ can be stored in a 2D Barcode	Challenges by selecting one type of 2D barcode.
			Requires updating software of the readers.
			Privacy concerns. Cannot be read with the naked eye.
5.	<b>Document number in OCR-B print in the visual zone</b>	Creates an automated link between the front side of the card and the back when scanned, with the document number. Not necessary to change anything.	Flipping is still needed.
		Creates a possibility to retrieve data from a national identity card database.	A link between the Immigration and Issuing Authority has to be in place.
			Only applicable for national purpose.
			Not an ICAO interoperable solution.
6.	<b>6-digit CAN code in additional zone</b>	Takes almost no additional space at the front side of the card.	Only CAN chip based MRTDs; as standardized in the TR Supplemental Access Control version: 1.01 date: 11 November 2010. Not suitable for BAC.
			Zone/location has to be defined and a standard be set.
7.	<b>Adjust reader equipment</b>	Td1 does not have to be changed.	Development of new equipment and software will take time and challenges for implementation.

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### 4. Application comparison for one-line MRZ

#### 4.1 One-line MRZ with accent on limited person query

Based on machine reading without flipping the card, the following table shows a comparison between the applications for the existing design and the suggested new design.

Non chip	Rear side down		Front side down		Chip enabled			
	current design	proposed design	current design	proposed design	current design	proposed design	current design	proposed design
BAC	n/a	n/a	n/a	n/a	√	√	X	√
VIZ	X	X	√	√	X	X	√	√
Ltd search key*	√	√	X	√	√	√	X	√
Full search key	√	√	X	X	√	√	X	√ <sup>1</sup>
Gain of proposed scheme versus current design: limited watch list search key capability without necessity to flip the card					Gain of proposed scheme versus current design: limited and full watch list search key capability without necessity to flip the card			

Limited search key\*

The search key for a watch list query consists of limited information from the holder's name (first 4 letters of the surname and the first letter of the given name) + full date of birth. There is no impact on the document number search

#### 4.2 Benefits and Consequences

- To enable positioning of a one-line MRZ on the front side, the signature is relocated to the rear.
- Change signature from MANDATORY into OPTIONAL.
- The one-line MRZ takes up a limited amount of space, enabling positioning it on the front side with a minimum effect on security features and the size of the photograph.
- The current specifications allow for document numbers, exceeding 9 characters. The proposed scheme has as a consequence that the document number MUST NOT exceed 9 characters.
- The proposed solution is suitable for BAC since Document Number, Date of Birth and Date of Expiry including their respective check digits are present on the front.
- The one-line MRZ is suitable for document background checks on non-chip MRTDs based on the presence of Document Number and Date of Expiry, but not Nationality. On chip enabled MRTDs the information read from the chip is RECOMMENDED to be used.

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<sup>1</sup> via chip (DG1)

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- For Person background checks on non-chip MRTDs the proposed solution only provides limited search key information (4 characters from the Surname and 1 character from the first name). On chip enabled MRTDs the information read from the chip is RECOMMENDED to be used, enabling the use of a longer search key.
- The proposed solution is backwards compatible; i.e. when reading the existing 3-line MRZ on the rear side, no system change is required. Use of the one-line MRZ on the front-side requires an inspection system change.

The proposed solution avoids the need to flip the card, still providing the means to:

- Perform database searches with limited search keys for both non-chip and chip enabled MRTDs.
- Perform Basic or Supplemental Access Control.
- Perform database searches with full search keys (MRZ information derived from DG1 in the chip).

#### 4.3 One-line MRZ with accent on a complete document number query

Based on machine reading without flipping the card, the following table shows a comparison between the applications for the existing design and the suggested new design.

Non chip	Rear side down		Front side down		Chip enabled			
	current design	proposed design	current design	proposed design	current design	proposed design	current design	proposed design
BAC	n/a	n/a	n/a	n/a	√	√	X	√
VIZ	X	X	√	√	X	X	√	√
Full doc no search key	√	√	X	√	√	√	X	√
Full person search key	√	√	X	X	√	√	X	√ <sup>2</sup>
Gain of proposed scheme versus current design: limited watch list search key capability without necessity to flip the card					Gain of proposed scheme versus current design: limited and full watch list search key capability without necessity to flip the card			

#### 4.4 Benefits and Consequences

- To enable positioning of a one-line MRZ on the front side, the signature is relocated to the rear.
- Change signature from MANDATORY into OPTIONAL.
- The one-line MRZ takes up a limited amount of space, enabling positioning it on the front side with a minimum effect on security features and the size of the photograph.
- The current specifications allow for document numbers, exceeding 9 characters. The proposed scheme has as a consequence that the document number MUST NOT exceed 9 characters.

<sup>2</sup> via chip (DG1)

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- The proposed solution is suitable for BAC since Document Number, Date of Birth and Date of Expiry including their respective check digits are present on the front.
- The one-line MRZ is suitable for complete document background checks on non-chip MRTDs based on the presence of Document type, Issuing Country, Document Number and Date of Expiry. On chip enabled MRTDs the information read from the chip is RECOMMENDED to be used.
- This alternative solution does NOT allow for Person background checks on non-chip MRTDs without flipping the card. On chip enabled MRTDs the information read from the chip is RECOMMENDED to be used, enabling the use of a longer search key. On non-chip MRTDs, the information for person background checks MUST be read from the rear.
- The proposed solution is backwards compatible; i.e. when reading the existing 3-line MRZ on the rear side, no system change is required. Use of the one-line MRZ on the front-side requires an inspection system change.

The proposed solution avoids the need to flip the card, still providing the means to:

- Perform database searches with unlimited search keys for both non-chip and chip enabled MRTDs for document background checks.
- Perform Basic or Supplemental Access Control.
- Perform database searches with full search keys for person and document checks (MRZ information derived from DG1 in the chip).

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## 5. Non-Chip versus Chip-enabled td1

### 5.1 Outcome TAG 7 – 9 December 2009 in Montreal

The TAG-MRTD noted the work done to date on the technical report follow-up research, and recognized the importance of border officials or passengers at self-service kiosks reading both electronic and non-electronic identity documents in an efficient and non-intrusive way. The TAG-MRTD would seek methods for creating synergy in reading ICAO-compliant travel documents, and approved further work to be carried out on the suggested approaches.

### 5.2 NTWG meeting in Bangkok

At the NTWG meeting in Bangkok in March 2010 it was decided that there will be different solutions for non-chip and chip enabled identity cards.

#### 5.2.1 Decision Non-Chip enabled td1

The general preference was to start first with a solution for chip enabled identity cards since a number of countries were already in the process introducing ICAO compliant e-td1 cards.

*The group decided to look into a solution for non-chip enabled td1's later.*

#### 5.2.2 Decision Chip enabled td1

**“It was a common decision for the chip enabled td1 sized MRTDs to use the Card Access Number (CAN) defined in the TR Supplemental Access Control.**

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## 6. Specifications for Chip-Based td1

### 6.1 Specification Supplemental Access Control

Supplemental Access Control is specified in the Technical Report “Supplemental Access Control for Machine Readable Travel Documents”, 1.01, November 11, 2010. This Technical Report specifies the PACE V2 protocol (Password Authenticated Connection Establishment Version 2) in which Document Number, Date-of-Birth, Date-of-Expiry (like in BAC), as well as a Card Access Number (CAN) can be used to generate the necessary keys for access to the chip.

### 6.2 CAN Specifications

If one wants to read the front side of the card AND access the chip without flipping the card to read the MRZ on the rear, the front side of the card needs to have machine readable information to access the chip. When the chip supports through PACE V2, this can be accomplished through the CAN. The CAN and its position on the front side of the MRTD are specified as follows:

- The CAN is a 6-digit number. There is no check digit, since the check is implicitly performed by the protocol.
- Font, field and background are conforming to the specifications for the MRZ as set out in Doc 9303, Part 3, Volume 1, and Edition 3 – 2008.
- Vertical position is conforming to the vertical position of one of the three MRZ lines as specified in Doc 9303, Part 3, Volume 1, Edition 3 – 2008.
- Horizontal position: at the discretion of the issuing State.

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### 6.3 Reference documentation

The following documentation served as reference for this Technical Report:

- [R1] RFC 2119, S. Bradner, "Key Words for Use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997
- [R2] ICAO Doc 9303, Part 3, Volume 1 "Machine Readable Official Travel Documents", Third Edition, 2008
- [R3] ICAO Doc 9303, Part 3, Volume 2 "Machine Readable Official Travel Documents", Third Edition, 2008
- [R4] TR Supplemental Access Control for Machine Readable Travel Documents, Version: 1.01. November 11, 2010

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### Annex A Abbreviations

Abbreviation	
2D Barcode	Two dimensional barcode
ABC	Automated Border Control
BAC	Basic Access Control
CAN	Card Access Number
DG	Data Group
ICAO	International Civil Aviation Organization
MRTD	Machine Readable Travel Document – generic term covering passport, visa and card
MRtd	Machine Readable Official Travel Document in the form of a card
MRZ	Machine Readable Zone
NTWG	New Technologies Working Group
OCR	Optical Character Recognition
OCR-B	A specific font designed for optical character recognition
PACE	Password Authenticated Connection Establishment
RF	Radio Frequency
SAC	Supplemental Access Control for Machine Readable Travel Documents
TAG	Technical Advisory Group
Td1	Size 1 Machine Readable Official Travel Document – 85,6 x 54 mm
Td2	Size 2 Machine Readable Official Travel Document – 105 x 74 mm
Td3	Size 1 Machine Readable Official Travel Document – 125 x 88 mm
TR	Technical Report
VIZ	Visual Zone

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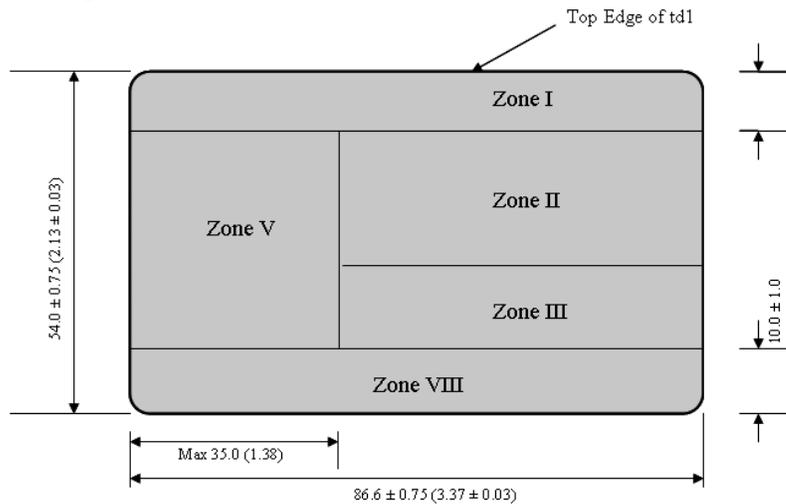
### Annex B Examples of Nominal Positions of Zones

#### Examples of Nominal Positioning of Zones

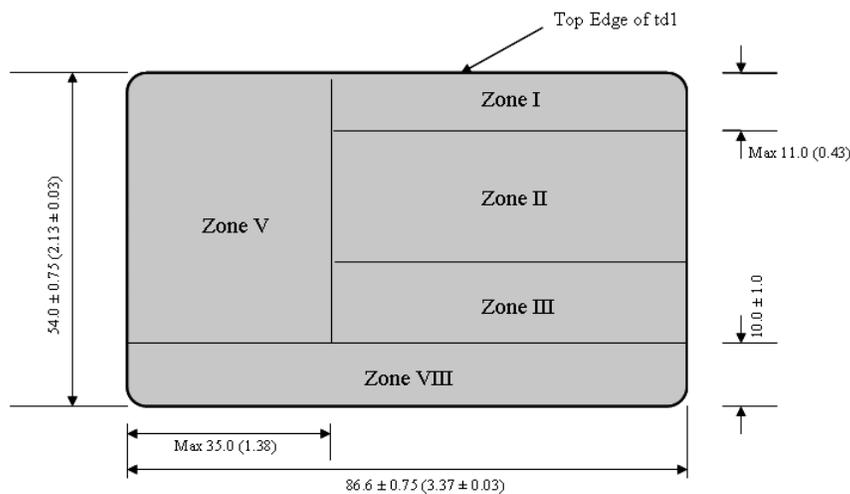
The proposed 1-line-MRZ on the front side SHALL be designated as Zone VIII according to the zone concept as outlines in [R2].

Zone IV, the signature, is relocated to the rear of the td1 card.

#### Example A (not to scale): front side of td1



#### Example B (not to scale): front side of td1 (alternative size of Zones I and V)



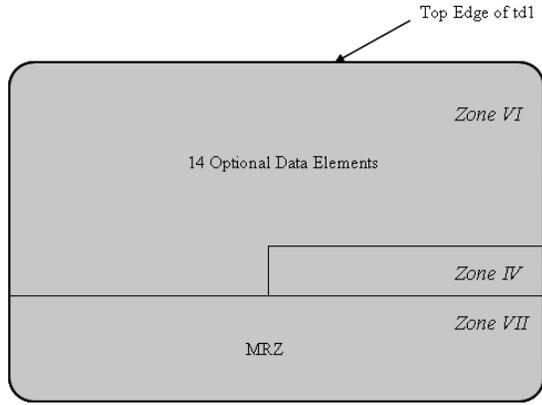
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**Example C** (not to scale): rear side of td1



**Example D** (not to scale): rear side of td1 (alternative position of zone IV)

