



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

**EIGHTEENTH MEETING**

**Montréal, 5 to 8 May 2008**

- Agenda Item 1: Activities of the NTWG**  
**Agenda Item 1.7 TD-1 Cards: Placement of Essential Information**

**TD-1 CARDS: PLACEMENT OF ESSENTIAL INFORMATION**

Presented by the New Technologies Working Group (NTWG)

**1. INTRODUCTION**

1.1 To be able to read travel documents by automatic means standards are needed. In the late '70s, ICAO developed an international standard for reading passports and other travel documents. These standards are laid down in DOC 9303.

1.2 Doc 9303 consists of 3 parts. 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 td2 format (105.0 x 74.0 mm).

1.3 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 size of documents.

1.4 In the 80's and the 90's not many states were considering 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 not much seen at border crossing points. These days States are changing more and more the format of their Identity Cards, which serves also as a travel document, to the td1 format.

1.5 Border Control Authorities, Airport Authorities and Airlines are using more often (e)-readers to facilitate their 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.

1.6 This working paper informs the members of the TAG about this issue and also presents a selection of new ideas.

## 2. CURRENT SITUATION

2.1 Today more than 50% of the issued Machine Readable Passports contain a contact less chip. They are referred to as e(lectronic) passports.

2.2 Almost all States who introduced an e-passport use the Basic Access Control (BAC) mechanism in order to protect the privacy of a citizen of their country.

2.3 To use BAC it is necessary to read first the Machine Readable Zone, to derive the necessary data to calculate the chip access keys. If the calculated access keys are correct the reader will get access to the data in the chip.

2.4 Since the late 90's more States are changing their Identity Cards from a non ICAO format or a td2 format into a td1 format. Some States also include the contact less chip in the identity card to be compatible with e-passports. For example, in the European Union 16 States already issue a td1 format Identity card to their citizens. Inclusion of the contact less chip according to ICAO specifications into the Identity card is also a recommendation of the European Union.

2.5 As a result more Border Control Authorities are equipping their process with (e)-readers in order to be able to read those travel documents. Additionally more Airport Authorities and Airlines use (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 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 Identity Card with the td2 format allow the biographical and document data to be read from one side of the document. To achieve the same result of the td1 document, first the rear side has to be read and then the front side of the card, to gather the biographical data from the bearer including the photo. Because of the size of the td1 format document the design had to be adjusted in the past to facilitate the machine readability.

3.2 When dealing with a td1 size card, the border control officer has to read first the MRZ on the rear side of the card (MRZ) for watch list searches. 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.

3.3 This is already a time consuming process, certainly in an operational environment at an airport, seaport or at the land border.

3.4 This is also the case for the passengers who use the td1 format card in a self-service kiosk by 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 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 information is necessary to open the chip.

3.6 td1 cards without the electronic component, but only with a MRZ, face the same issues in an automated environment.

#### 4. **NEW SOLUTION NECESSARY**

4.1 Due to this new situation with the use of the td1 format cards in an operational process is it necessary to look for new solutions.

4.2 A sub-working group of the New Technologies Working Group has analyzed the issue and came up with new proposals. These were associated with repositioning part of or the whole MRZ to the front of the td1 where also the most important biographical data should be positioned till the use of dedicated (already existing) equipment.

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

#### 5. **ACTION BY THE TAG**

5.1 The NTWG invites the TAG/MRTD:

- a) to take note of the work that has been done to date on the technical report;
- b) recognize the importance of reading e-travel documents at the border in an efficient and non intrusive way by border officials or the passengers themselves at a self-service kiosk;
- c) to look for solutions to create synergy in reading ICAO compliant travel documents;
- d) to submit to the sub-working group other options in order to find the most efficient way to address the automated processing issues relating to td1 format cards;
- e) to approve continuation of the on-going work in this area.

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# MACHINE READABLE TRAVEL DOCUMENTS



## TECHNICAL REPORT

### *Machine Reading options for td1 size Machine Readable Official Travel Documents*

Version – **0.45**  
Date - April 30, 2008

*Published by authority of the Secretary General*

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

File	: TR-New specifications td1 Card V0.45
Author	: ICAO/NTWG Sub-Working Group for new specifications td1 Card

## Technical Report Machine Reading Options for td1 size MRtds

Release : 0.45  
Date : April 30, 2008

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### Release Control

Release	Date	Description
0.1	12-12-2007	First draft discussed in The Hague, December 12 2007
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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 Sjef Broekhaar)

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# 1. Introduction

## 1.1 Background

Sometimes it is necessary to reconsider decisions and solutions which were taken years ago. At that time the decision would have fitted in the environment it was made for. But over the years the environment can change and the decision remains the same. This can cause a conflict and needs reconsideration.

In the 80's 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 td2 format (105.0 x 74.0 mm).

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. For many years wallets and billfolds are designed to hold these size of documents.

In the 80's and the 90's few States were considering 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 not much seen at border crossing points.

Since the late 90's more States are changing their Identity Cards from a non ICAO format or a td2 format into an ICAO compliant td1 format. Some States also include the contactless chip in the identity card to be compatible with e-passports. For example, in the European Union 16 States already issue a td1 format Identity card to their citizens. Inclusion of the contact less chip according to ICAO specifications into the Identity card is also a recommendation of the European Union.

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

When dealing with a td1 size card, the border control officer first has to read the MRZ on the rear side of the card for watch list searches. The card then has 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.

This is already a time consuming process, certainly in an operational environment at an airport, seaport or at the land border.

This is also the case for the 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 more evident that the design of the card will lead to the above mentioned issues, since the MRZ information is necessary to open the chip.

Knowing this, we can identify three important areas:

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

With respect to point 1 there is an interesting fact to mention. 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 Identity Card with the td2 format allow the biographical and document data to be read from one side of the document. 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 from the bearer including the photo. Because of the size of the td1 format document the design had to be adjusted in the past to facilitate the machine readability. This technical report is looking into this challenge.

Point two is a result of efficiency and availability. A credit card size card is easier to handle in a diversity of applications. Wallets and billfolds are already designed to keep this kind of document size, so it was a logical decision of many governments to change the format.

There are more approaches to this challenge than only looking at the card. Point three gives the opportunity to look also to the machines assisting this process. This technical report will also look into the possibility to change the equipment and the automated reading process.

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 and efficiency of security features are of paramount importance in the card design to maintain high security 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, traveller facilitation in the form of Automated Border Crossing (ABC) initiatives, will result in the handling of the travel document by the traveller him- or herself.

The NTWG, in its meeting in Singapore in September 2007, recognized that machine reading of td1 sized cards in situations where both the Machine Readable Zone 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 security features are on the front side.

Reading both data from the MRZ and information from the front side requires flipping the card, which, especially in an ABC environment, can easily cause handling problems.

It was decided at the NTWG meeting in Singapore in September 2007 to investigate the possibilities to overcome the recognized difficulties in handling the card during the inspection process.

### 1.2 Operational Experiences

During a trial at Schiphol-Airport in Amsterdam between 18 June 2007 and 13 November 2007, where the td1 Identity 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.



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- 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 gave the following problems:

- Due to the limited space for the hand under the top plate of the scanner, the user couldn't see what is happening under the plate.
- As the physical construction of an ID-card is synthetic and flat, a user with short finger nails had difficulties to remove the card from the scanner or turn the card.
- An automated match between the front side and the 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 belong 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: 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 "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 a td 1 size, border control authorities want to check and compare the contents as well as the authenticity (including security features) of:

- 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 and
- ii) the 3-line MRZ on the back side of the card.

The inspection process, taking into consideration also a future self-service or semi-automated procedure, should be generic for td1, td2 and td3 size MR travel documents. I.e., if the turning of a data page is not required for a MRP, 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 an td1 card than from the more or less unprotected MRZ of the rear side of the card, even if this results in OCR errors. To overcome this problem, issuing authorities might consider to:

- protect the back side of a card by using advanced security features without obstructing OCR readability and/or
- 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 machine readable travel documents 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
Part 1 <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
Part 2 <i>Machine Readable Visas</i>	MRV-A: 80.0 mm × 120.0 mm MRV-B: 74.0 mm × 105.0 mm	Front Side	Front Side – 2 line MRZ
Part 3 <i>Machine Readable</i>	Size-1 MRtd (td1): 53.98 mm × 85.60 mm	Front Side	td1: Rear Side – 3 line

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<i>Official Travel Documents, Vol.1 Official Travel Documents with machine readable data stored in Optical Character Recognition Format</i>	Size-2 MRtd (td2): 74.0 mm × 105.0 mm		MRZ td2: Front Side – 2 line MRZ
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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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## 3. Technical specifications

### 3.1 Prerequisites

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

- To minimize the risk of reader incompatibility, the solution must be based on OCR-B.
- The solution must support at least BAC; as a consequence it will have to provide Document Number, Date of Birth and Date of Expiry.
- MRtd's 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.
- The solutions needs to support one-side-reading of both chip- and non-chip enabled MRtd's.

### 3.2 Options

The following table lists the options and their pro's and cons with respect to the inspection process requirements.

Nr.	Option	Pro	Con
1.	3-line MRZ on the front	no flip for chip and non-chip	not enough space
		contains info for person background checks	visual zone fonts would need to become too small
		contains info for document background checks	picture would need to become too small
		contains info for BAC	less space for security features
2.	1-line MRZ on the front	takes less space than 3-line MRZ	takes up space
		no flip for chip and non-chip	requires new zone
		contains info for document background checks	requires zone shifting
		contains (limited) info for person background checks	might not contain enough info for background checks
		contains info for BAC	software change for readers
3.	2D Barcode on front side		9 characters document number
			cannot be read by a person
			requires additional new reading technology
4.	OCR-B document number in visual zone	no additional zone	Only PACE chip based
			not suitable for background checks
			not suitable for BAC
5.	6-digit PACE code in additional zone		Only PACE chip based; not standardized yet
			new zone required
			not suitable for background checks
			not suitable for BAC

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6.	Adjust reader equipment	td1 has not to be changed	Extra piece of equipment on counter of immigration or integrated in kiosk

### 3.3 Options explained

#### 3.3.1 Option 1: 3-line MRZ data on the front side

There are already countries who issue a td1 card with a three line MRZ at the front side. See example hereunder:



#### 3.3.2 Option 2: 1-line MRZ data on the front side

The recommended solution consists of specifying a one-line MRZ on the front side of the card. This MRZ consists of 30 positions:

- Document Number + Check digit (9+1 digits, as in the full MRZ on the back side).  
123456789C (10 positions)
- Date of Birth + Check digit (6+1 digits, as in the full MRZ on the back side).  
YYMMDDC (7 positions)
- Date of Expiry + Check digit (6+1 digits, as in the full MRZ on the back side).  
YYMMDDC (7 positions)
- First four characters of the holder's Surname (4 letters).  
SSSS (4 positions)
- First character of the holder's First name (1 letter).  
F (1 position)
- Overall check digit over this line (1 digit).  
8 (1 position)

As a consequence the one-line MRZ on the front of the MRtd is composed as follows:  
123456789CYMMDDCYMMDDCSSSSF8

#### 3.3.3 Option 3: 2D-Barcode on the front side of the card

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### 3.3.4 Option 4: Document number in OCR-B in visual zone

### 3.3.5 Option 5: 6-digit PACE code in additional zone

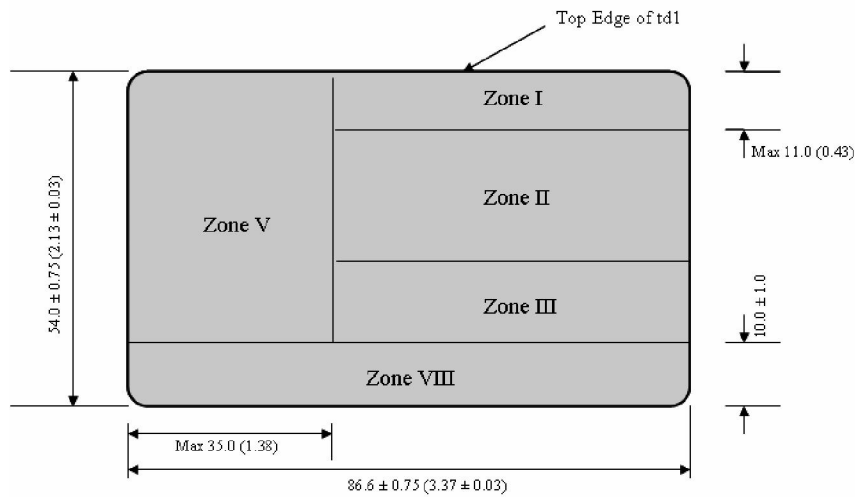
### 3.3.6 Option 6: Adjust reader equipment

### 3.3.7 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.

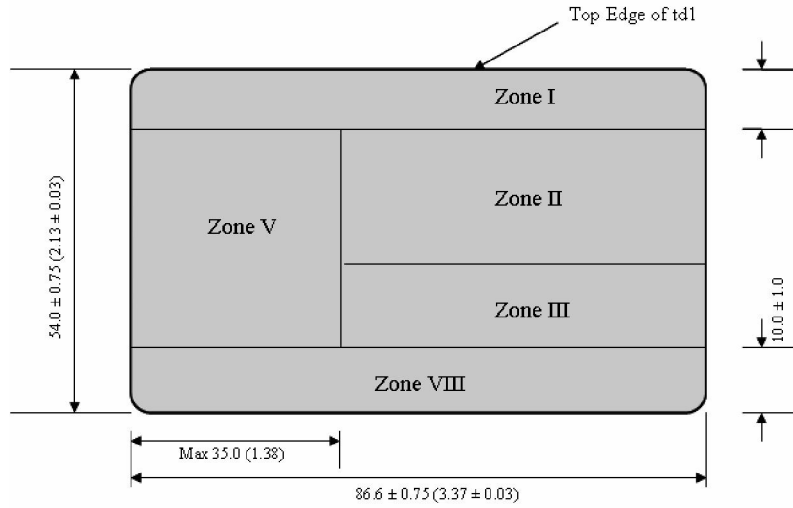
Example A (not to scale): front side of td1



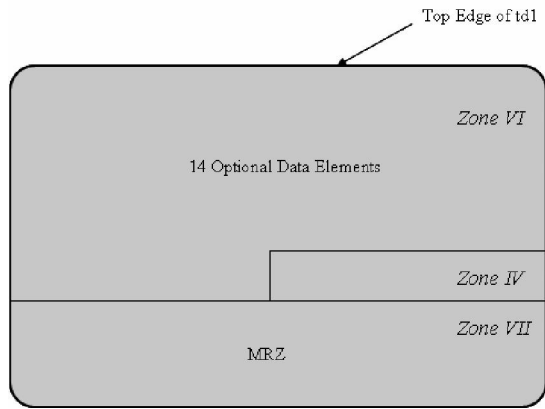
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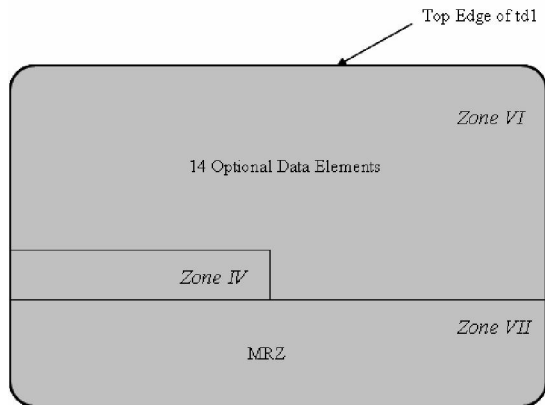
Example B (not to scale): front side of td1 (alternative size of Zones I and V)



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



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



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### 3.3.8 Examples of personalized td1 cards



Illustration of the front side for a td1-size card using the proposed design  
(based on a Swiss ID-card; used and modified with permission of the Swiss Authorities for example purposes only)



Illustration of the rear side for a td1-size card using the proposed design  
(based on a Swiss ID-card; used and modified with permission of the Swiss Authorities for example purposes only)

### 3.4 Application comparison

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		Rear side down		Front side down	
	current design	proposed design	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 + full date of birth. There is no impact on the document number search.

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



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### 3.5 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.
- 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 Access Control;
- perform database searches with full search keys (MRZ information derived from DG1 in the chip).

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### 4. Alternative recommended solution

#### 4.1.1 MRZ data

The recommended solution consists of specifying a one-line MRZ on the front side of the card. This MRZ consists of 30 digits:

- Document type (2 digits)
- Issuing country (3 digits according ICAO 3 letter code)
- Document Number + Check digit (9+1 digits, as in the full MRZ on the back side).  
123456789C
- Date of Birth + Check digit (6+1 digits, as in the full MRZ on the back side).  
YYMMDDC
- Date of Expiry + Check digit (6+1 digits, as in the full MRZ on the back side).  
YYMMDDC
- Overall check digit over this line not including Document type and issuing country (1 digit).  
C

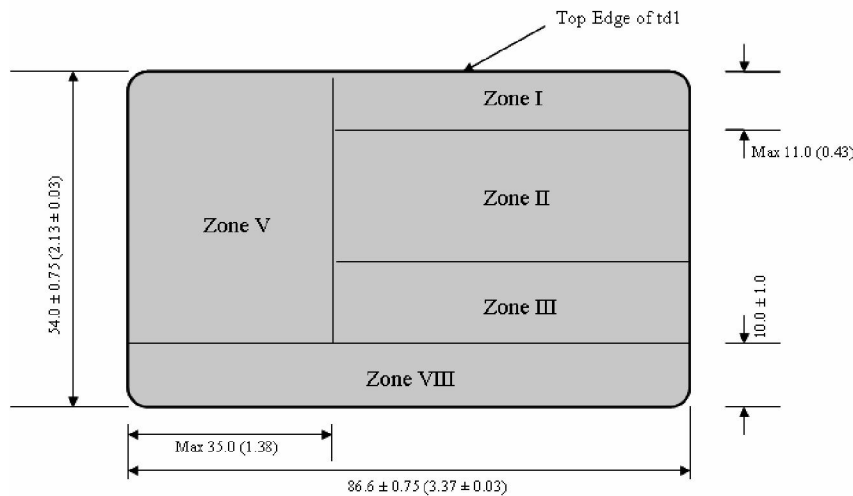
As a consequence the one-line MRZ on the front of the MRtd is composed as follows:  
IDXXX123456789CYMMDDCYMMDDCC

#### 4.1.2 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.

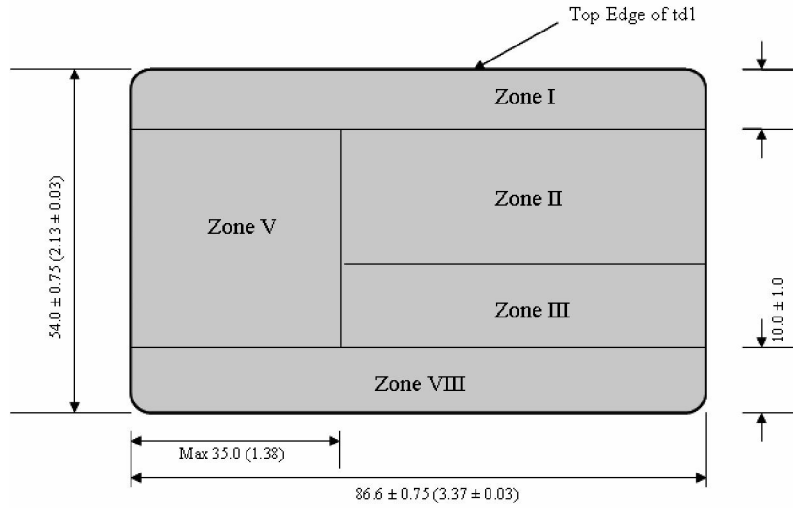
Example A (not to scale): front side of td1



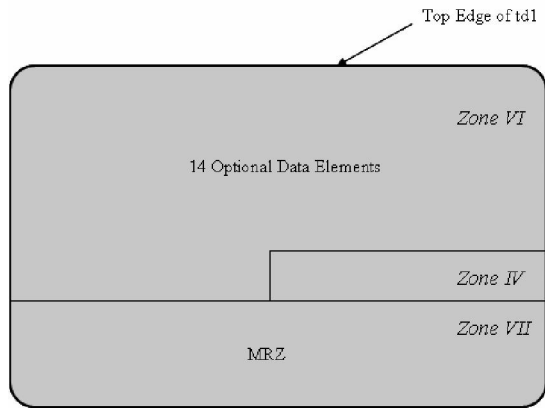
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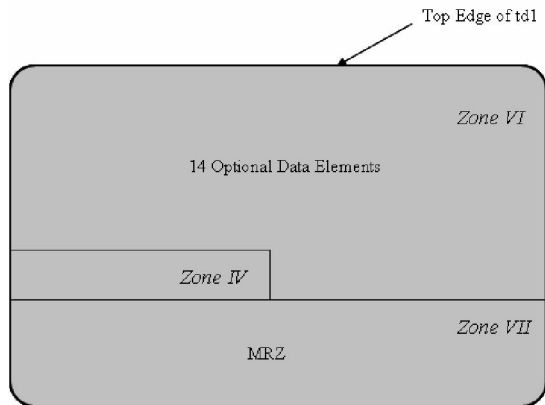
Example B (not to scale): front side of td1 (alternative size of Zones I and V)



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



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



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### 4.1.3 Examples of personalized td1 cards

	<p>Illustration of the front side for a td1-size card using the <b>alternative</b> proposed design (based on a Swiss ID-card; used and modified with permission of the Swiss Authorities for example purposes only)</p>
	<p>Illustration of the rear side for a td1-size card using the proposed design (based on a Swiss ID-card; used and modified with permission of the Swiss Authorities for example purposes only)</p>

## 4.2 Application comparison

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 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			

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

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### 4.3 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 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 allows NOT 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 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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### Annex A 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 "Machine Readable Official Travel Documents", third edition, 2008 (under construction)

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### Annex B Abbreviations

Abbreviation	
ICAO	International Civil Aviation Organization
MRTD	Machine Readable Travel Document
NTWG	New Technologies Working Group
TAG	Technical Advisory Group

- END -