2nd Symposium on ICAO-Standard MRTDs, Biometrics and Security

From Basic MRTDs to Biometric ePassports

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International standards
ICAO standards

ICAO DOCUMENT 9303 (Parts 1-3), Family of MRTDs:

- Part 1: Machine Readable Passports (MRPs)
- Part 2: Machine Readable Visas (MRVs)
- Part 3: Official Travel Documents (cards)
ICAO standards

**SECURITY STANDARDS**
- Document security: Annex A
- Security of issuing process: G8 Annex A
ICAO 9303 – status

Structure of Document

Part 1
Passports

Volume 1
MRP w/o add. storage
6th edition tbp

Volume 2
MRP w/ expansion of data storage capacity

Part 2
Visa

3rd edition 2005

Part 3
ID cards

Volume 1
MRTD w/o add. storage

Volume 2
MRTD w/ expansion of data storage capacity

3rd edition tbr
What is a MRTD?

Machine readable travel document (MRTD):

“Official document issued by a State or organisation which is used by the holder for international travel and which contains mandatory visual (eye readable) data and a separate mandatory data summary in a format which is capable of being read by machine.” ICAO Doc 9303, II-2
What is a MRP?

Machine readable passport (MRP):

“Passport conforming with the specifications contained in Doc 9303, Part I. Normally constructed as an ID-3 size book [...]”

ICAO Doc 9303, II-2
Part 1 (6th edition) – Passports

- Review by ISO, comments integrated
- Final draft version of WG submitted to TAG Secretariat
- Draft version available from Mary McMunn mmcmunn@icao.int
Data page layout

- Photo
- VIZ
- MRZ

Dimensions:
- 88mm (vertical)
- 125mm (horizontal)
Visual inspection zone (VIZ)

Zone I
- Header
- Personal data elements

Zone II
- Document data elements

Zone III
- Identification feature

Zone IV
- Signature
Visual inspection zone (VIZ)
Diagram 2. Flexible positioning of Zones 1 to V

Example 1

Zone I

Zone II

Zone III

Zone IV

Zone V

Machine readable zone

Zone VII
VIZ – zone location options

Example 2

Zone I
Zone II
Zone III
Zone V
Machine readable zone
Zone VII
VIZ – zone location options

Field 13 – optional personal data elements (ghost image, fingerprint, etc) (VR)
VIZ – zone location options

Field 18 – Holder’s signature or usual mark (VR), may be located in Zone VI (rear)
VIZ – zone location options
VIZ – zone location options
VIZ – zone VI

Top of back

Optional data elements

Back of the MRP data page, or an adjacent page

Not to scale
Machine readable zone (MRZ)
MRZ – OCR-B

“Machine readable information is contained in two lines of OCR-B text, each with 44 characters”. ICAO Doc 9303, II-2
Part 2 – Visa

- Interoperability a must? Airlines!
- 3 eVisa possibilities
  - in visa label
  - in database (also supporting label)
  - in ePassport chip (future possibility)
Example of MRV-A
Zone boundaries: MRV-A

Top edge of MRV-A (Layout 2)

80.0 ± 0.10 (3.15 ± 0.04)

120.0 ± 1.0 (4.72 ± 0.04)

29.0 ±/−3.0 (1.14 ±/−0.12)

12.0 (0.47)

36.0 ±/−4.0 (1.42 ±/−0.16)

Zone V

Zone I

Zone III

Zone II

Zone IV

Machine Readable Zone

Zone VII

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Machine-readable zone: MRV-A

country code

document type

primary & secondary identifiers (names)

filler characters

passport or visa number

nationality

sex

date of birth

date of expiry

optional data

check digits
Example of MRV-B
Zone boundaries: MRV-B

Top edge of MRV-B (Layout 2)

1. Machine Readable Zone
   - Zone I
   - Zone II
   - Zone III
   - Zone IV
   - Zone V
   - Zone VII

Dimensions:
- 74.0 ± 1.0 (2.91 ± 0.04)
- 232 ± 1.0 (9.91 ± 0.04)
- 355 ± 3.5 (14.0 ± 0.14)
- 105.0 ± 1.0 (4.13 ± 0.04)
- 28.5 ± 2.5 (1.12 ± 0.10)
- 12.0 (0.47)
Machine-readable zone: MRV-B

country code

document type

primary & secondary identifiers (names)

filler characters

passport or visa number

nationality

sex

date of birth

date of expiry

check digits

optional data

282nd Symposium on ICAO-Standard MRTDs, Biometrics and Security 28
Visa positioning in passport
European MRV
Part 3 – Official Travel Documents (cards)

- Interoperability needed
- National ID card used for travel
- Standards as for ePassports
- Part 3 currently under revision in TAG/MRTD secretariat, DCFWG finished work
Part 3 – Official Travel Documents (cards)

Currently many variations
Example of td1 (ID1-sized card)

53.98mm Front

Rear

85.60mm
Machine-readable zone: td1

country code

document type
document number
filler characters

sex
date of birth
date of expiry

nationality
check digits
optional data

primary & secondary identifiers (names)
filler characters

document number

sex
date of birth
date of expiry

nationality
check digits
optional data

primary & secondary identifiers (names)
filler characters
Example of td2 (ID2-sized card)
Machine-readable zone: td2

- Country code
- Document type
- Primary & secondary identifiers (names)
- Filler characters
- Passport or visa number
- Nationality
- Sex
- Date of birth
- Date of expiry
- Optional data
- Check digits
Options for expansion of machine-readable data storage:
- Bar codes
- Magnetic stripes
- Integrated circuit with contacts
- Contactless integrated circuits
- Optical memory
Options for expansion of machine-readable data storage:

- Bar codes
- Magnetic stripes
- Integrated circuit with contacts
- Contactless integrated circuits
- Optical memory
Coexistence

- OCR technology mandatory
- Coexistence of OCR with contactless integrated circuit conforming to standards in ICAO Doc 9303 Part 3 Volume 2 critical to ensure global interoperability
Next generation MRP: smart, with biometrics & chip

Chip

Arial
ICAO Blueprint

- Facial image
- Finger Print
- Iris
- RF Chip (min 32K)
- LDS
- PKI
Growth (no. of countries)
Growth (volume issued p.a. (m))

900m MRTDs in circulation worldwide
Data page – importance

- Data page is the most important page in a passport
  - the most examined
  - contains all the personal data
  - requires the most protection against counterfeit and fraudulent alteration
**Data page – under pressure**

- It must provide protection against counterfeit and fraud, especially from desktop publishing.
- It must meet the needs of immigration – easily and quickly verifying the holder.
- It must be machine readable - OCR & chip.
Security features

- Security must be multi-layer and the most important are the level 1 features
- The security features need to protect the holder’s photograph
- Important not to obstruct the MRZ
- Security features can be included on the front and back
Data page – inside page
Layers

Photo

88mm

35mm

45mm

125mm

P<GBRSMITH<<MICHELLE<<CAROLINE<<<<<<<<<<<
00000056<3GBR7111114F13032030000507<<<<60
Elements

Substrate
Elements
Elements
Paper substrate: UV dull
Chemical sensitisation
Cylinder mould watermark
Fibres & planchettes
Thread
Thread
Thread
Intended benefits

- To facilitate and secure passenger processing at border control points
- To enable global interoperability
Why interoperability?

- International travel
- Border control – 189 member states
- Airlines – carriers’ liability act
- Banks
MRTD interoperability

- Standards evolved over nearly 3 decades
- Balance between facilitation and security
- Interoperability includes:
  - ISO standards
  - Eye readable data
  - MR data – OCR B
  - ePassports
    - Biometrics
    - DSM
    - LDS/PKI
ICAO Doc 9303 Parts 1-3
interoperability

- Cultural considerations
  - Flexibility in VIZ
  - Truncation
  - Transliteration
- Reader standards – OCR & “e”
- Document specs; security features
Facilitation and security

- Opposing requirements?
- 9303 recommendations on:
  - Passport security features
  - Security of issuing process
All component parts must be mutually supporting
The solution is normally a compromise
VIZ – zone location options
Thank you for your attention

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