



ICAO

Doc 9303

Machine Readable Travel Documents

Eighth Edition, 2021

Part 1: Introduction



Approved by and published under the authority of the Secretary General

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Doc 9303, *Machine Readable Travel Documents*

Part 1 — *Introduction*

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TABLE OF CONTENTS

	<i>Page</i>
1. FOREWORD.....	1
2. SCOPE	1
3. GENERAL CONSIDERATIONS	2
3.1 ICAO's Leadership Role	2
3.2 Relative Costs and Benefits of Machine Readable Travel Documents	2
3.3 Operations	3
3.4 Endorsement by ISO	3
4. DEFINITIONS AND REFERENCES	4
4.1 Acronyms.....	4
4.2 Terms and Definitions.....	8
4.3 Key Words	25
4.4 Object Identifiers.....	26
4.5 The Use of Notes.....	29
5. GUIDANCE ON THE USE OF DOC 9303	29
5.1 Doc 9303 Composition	29
5.2 Relationship between MRTD Form Factors and relevant Doc 9303 Parts.....	31
6. REFERENCES (NORMATIVE).....	31

1. FOREWORD

ICAO's work on machine readable travel documents began in 1968 with the establishment, by the Air Transport Committee of the Council, of a Panel on Passport Cards. This Panel was charged with developing recommendations for a standardized passport book or card that would be machine readable, in the interest of accelerating the clearance of passengers through passport controls. The Panel produced a number of recommendations, including the adoption of optical character recognition (OCR) as the machine reading technology of choice due to its maturity, cost-effectiveness and reliability. In 1980, the specifications and guidance material developed by the Panel were published as the first edition of Doc 9303, titled *A Passport with Machine Readable Capability*, which became the basis for the initial issuance of machine readable passports by Australia, Canada and the United States.

In 1984, ICAO established what is now known as the Technical Advisory Group on Machine Readable Travel Documents (TAG/MRTD), comprised of government officials who specialize in the issuance and border inspection of passports and other travel documents, in order to update and enhance the specifications which had been prepared by the Panel. Subsequently, this group's terms of reference were expanded to include, first, the development of specifications for a machine readable visa and, later, specifications for machine readable cards that may be used as official travel documents.

In 1998, the New Technologies Working Group of the TAG/MRTD began work to establish the most effective biometric identification system and associated means of data storage for use in MRTD applications, particularly in relation to document issuance and immigration considerations. The bulk of the work had been completed by the time the events of 11 September 2001 caused States to attach greater importance to the security of a travel document and the identification of its holder. The work was quickly finalized and endorsed by the TAG/MRTD and the Air Transport Committee.

The resulting Technical Reports on the employment of biometrics and contactless chip technology, Logical Data Structure (LDS), and Public Key Infrastructure (PKI) were incorporated into Volume 2 of the Sixth Edition of Doc 9303, Part 1 (*Machine Readable Passports*) in 2006, and Volume 2 of the Third Edition of Doc 9303, Part 3 (*Machine Readable Official Travel Documents*) in 2008.

2. SCOPE

Doc 9303 consists of various separate documents in which general (applicable to all MRTDs) as well as MRTD form factor specific specifications are grouped. See Section 5.1 "Doc 9303 Composition" for an overview.

These specifications are not intended to be a standard for national identity documents. However, a State whose identity documents are recognized by other States as valid travel documents shall design its identity documents such that they conform to the specifications of Doc 9303-3 and Doc 9303-4, Doc 9303-5 or Doc 9303-6.

Although the specifications in Doc 9303-4 are intended for particular application to the passport, these specifications apply equally to other TD3 size identity documents, for example, the laissez-passer, the seafarer's identity document and refugee travel documents.

The document at hand is Part 1. Part 1 introduces the Doc 9303 specifications. It describes the build-up of the thirteen parts of Doc 9303, provides general information on ICAO, and guidance on the terminology and abbreviations used throughout the specifications.

3. GENERAL CONSIDERATIONS

3.1 ICAO's Leadership Role

ICAO's initiative to develop standard specifications for passports and other travel documents followed the tradition established by the League of Nations Passport Conferences of the 1920s and the work of the League's successor, the United Nations Organization. ICAO's mandate to continue in its leadership role stems from the Convention on International Civil Aviation (the "Chicago Convention") which covers the full range of requirements for efficient and orderly civil aviation operations, including provisions for clearance of persons through border controls, i.e.:

- a) the requirement for persons travelling by air and aircraft crews to comply with immigration, customs and passport regulations (Article 13);
- b) the requirement for States to facilitate border clearance formalities and prevent unnecessary delays (Article 22);
- c) the requirement that States collaborate in these matters (Article 23); and
- d) the requirement for States to develop and adopt internationally standard procedures for immigration and customs clearance (Article 37 j)).

Under this mandate, ICAO develops and maintains international Standards in Annex 9 — *Facilitation* to the Chicago Convention for implementation by Member States. In the development of such Standards, it is a fundamental precept that if public authorities are to facilitate inspection formalities for the vast majority of air travellers, those authorities must have a satisfactory level of confidence in the reliability of travel documents and in the effectiveness of inspection procedures. The production of standardized specifications for travel documents and the data contained therein is aimed at building that confidence.

In 2004, the Assembly of ICAO affirmed that cooperative work on specifications to strengthen the security and integrity of travel documents should be pursued by the Organization as a matter of high priority. In addition to the International Organization for Standardization (ISO), consultants to the TAG/MRTD include the International Air Transport Association (IATA), the Airports Council International (ACI), and the International Criminal Police Organization (INTERPOL).

In 2005, the then 188 Member States of ICAO approved a new Standard that all States must begin issuing machine readable passports in accordance with Doc 9303 no later than the year 2010. No later than the year 2015 all non-machine readable travel documents must have expired. This Standard is published in the 13th Edition (2011) of Annex 9 — *Facilitation*.

3.2 Relative Costs and Benefits of Machine Readable Travel Documents

Experience with the issuance of machine readable passports, in conformity with the specifications set forth in Doc 9303, indicates that the cost of producing MRTDs may be no greater than that of producing conventional documents, though the cost will be higher when biometric identification and electronic travel documents are implemented. As traffic volumes grow and more States focus on how they can rationalize their clearance processes with the employment of

computerized databases and electronic data interchange, the MRTD plays a pivotal part in modern, enhanced compliance systems. Equipment to read the documents and access the databases may entail a substantial investment, but this can be expected to be returned by the improvements in security, clearance speed and accuracy of verification which such systems provide. Use of MRTDs in automated clearance systems may also make it possible for States to eliminate both the requirement for paper documents, such as passenger manifests and embarkation/disembarkation cards, and the administrative costs associated with the related manual procedures.

3.3 Operations

The basic machine readable travel document, with its OCR readability, is designed for both visual and mechanical reading.

ICAO Member States have recognized that standardization is a necessity and that the benefits of adopting the Doc 9303 standard formats for passports and other travel documents extend beyond the obvious advantages for States that have the machine readers and databases for use in automated clearance systems. In fact, the physical characteristics and data security features of the documents themselves offer strong defence against alteration, forgery or counterfeit. Moreover, adoption of the standardized format for the visual zone of an MRTD facilitates inspection by airline and government officials, with the result that clearance of low-risk traffic is expedited, problem cases are more readily identified, and enforcement is improved. The optional introduction of biometric identification with data stored on a contactless integrated circuit will provide greater security and resistance to fraud and thus make it easier for the legitimate document holder to obtain visas for travel and to be processed through border inspection systems.

Note.— It is recognized that situations will arise where an eMRTD will not interface correctly with a reader at a border. There are several reasons why this might occur, of which a failure of the eMRTD is only one. ICAO emphasizes that an eMRTD which fails to read is nevertheless a valid document. However, a failure to read could be the result of fraudulent attack, and the receiving State should establish its own procedures for dealing with this possibility, which should involve more stringent inspection of the document and its holder but also allow that the failure involves no fraudulent intent.

3.4 Endorsement by ISO

The technical specifications sections of Doc 9303 have received the endorsement of the International Organization for Standardization as ISO Standard 7501. Such endorsement is made possible by means of a liaison mechanism through which manufacturers of travel documents, readers and other technologies provide technical and engineering advice to the TAG/TRIP under the auspices of ISO. Through this working relationship, the ICAO specifications have achieved, and are expected to continue to receive, the status of worldwide standards by means of a simplified procedure within ISO.

The liaison mechanism with ISO has been successfully applied not only to the endorsement of new specifications for travel documents as ISO standards but also to the approval of amendments to the specifications. Subsequent revisions to Doc 9303 will therefore be processed for ISO endorsement in the same manner as previously.

4. DEFINITIONS AND REFERENCES

4.1 Acronyms

Acronym	Full form
3DES	Triple DES
AA	Active Authentication
ABC	Automated Border Control
AFS	Anti-Fraud Specialist
AES	Advanced Encryption Standard
AID	Application Identifier
APDU	Application Protocol Data Unit
AO	Authorizing Officer
BAC	Basic Access Control
BER	Basic Encoding Rules
BLOB	Binary Large Object
BSC	Bar Code Signer Certificate
CA	Certification Authority – also – Chip Authentication
CAM	Chip Authentication Mapping
CAN	Card Access Number
CAR	Certification Authority Reference
CBC	Cypher Block Chaining
CBEFF	Common Biometric Exchange Format Framework
CCD	Charge-Coupled Device
C _{DS}	Document Signer Certificate
CIC	Contactless Integrated Circuit
CID	Card IDentifier
CMAC	Cipher-based Message Authentication Code
CMOS	Complementary Metal–Oxide–Semiconductor
CRL	Certificate Revocation List
CSCA	Country Signing Certification Authority
CSD	Camera to Subject Distance; distance between the eyes plane of a person and the optical centre of the camera lens
CVCA	Country Verifying Certification Authority
DER	Distinguished Encoding Rule

Acronym	Full form
DES	Data Encryption Standard
DF	Dedicated File
DG	Data Group
DH	Diffie Hellmann
DN	Distinguished Name
DO	Data Object
DOVID	Diffraction Optically Variable Image Device (feature with diffraction optically variable effects, e.g. holographic effects)
DS	Document Signer
DSA	Digital Signature Algorithm
DTA	Digital Travel Authorization
DTBS	Data To Be Signed
DV	Document Verifier
EAL	Evaluation Assurance Level
ECDH	Elliptic Curve Diffie Hellmann
ECDSA	Elliptic Curve Digital Signature Algorithm
ECKA	Elliptic Curve Key Agreement
EEPROM	Electrically Erasable Programmable Read Only Memory
EF	Elementary File
EM	Eye to Mouth distance
eMRP	Electronic Machine Readable Passport
eMROTD	Electronic Machine Readable Official Travel Document
eMRTD	Electronic Machine Readable Travel Document
eRP	Electronic Residence Permit
ERZ	Effective Reading Zone
ETS	Electronic Travel System
EVZ	Eye visibility zone; zone covering a rectangle having a distance V of at least 5% of the IED to any part of the visible eyeball
FAR	False Acceptance Rate
FIPS	Federal Information Processing Standard
FRR	False Rejection Rate
GM	Generic Mapping