ICAO

Doc 9303

Machine Readable Travel Documents

Eighth Edition, 2021

Part 7: Machine Readable Visas

Approved by and published under the authority of the Secretary General

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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AMENDMENTS

Amendments are announced in the supplements to the *Products and Services Catalogue;* the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS		
No.	Date	Entered by

CORRIGENDA		
No.	Date	Entered by

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1. SCOPE

Part 7 defines the specifications for machine readable visas (MRV) which allow compatibility and global interchange using both visual (eye readable) and machine readable means. The specifications lay down standards for visas which can, where issued by a State and accepted by a receiving State, be used for travel purposes. The MRV shall, as a minimum, contain the data specified herein in a form that is legible both visually and by optical character recognition methods, as presented herein. Part 7 contains specifications for both Format-A and Format-B types of visas.

Part 7 shall be read in conjunction with:

- Part 1 — *Introduction*;
- Part 2 — *Specifications for the Security of the Design, Manufacture and Issuance of MRTDs*;
- Part 3 — *Specifications Common to all MRTDs*; and
- Part 13 — *Visible Digital Seals.*

2. TECHNICAL SPECIFICATIONS FOR FORMAT-A MACHINE READABLE VISAS (MRV-A)

This section defines those specifications which are unique to Format-A machine readable visas (MRV-A) and are necessary for global interoperability. Specifications are included for the discretionary expansion of the machine readable data capacity of the MRV beyond that defined for global interoperability. The MRV-A is suitable for use by States that wish to have maximum space available to accommodate their data requirements and that do not need to maintain a clear area on the passport visa page adjacent to the visa.

2.1 Dimensions and Placement of the MRV-A

The dimensions and placement of the MRV-A shall be as follows:

MRV-A nominal dimensions. The nominal dimensions of the MRV-A shall be as follows:

80.0 mm × 120.0 mm (3.15 in × 4.72 in)

MRV-A margins. The dimensional specifications refer to the outer limits of the MRV-A. A margin of 2.0 mm (0.08 in) along each outer edge, with the exception of the header zone, must be left clear of data.

MRV-A edge tolerances. The edges of the MRV-A shall be within the area circumscribed by the concentric rectangles as illustrated in Figure 1.

Inner rectangle: 79.0 mm × 119.0 mm (3.11 in × 4.69 in)
Outer rectangle: 81.0 mm × 121.0 mm (3.19 in × 4.76 in)

MRV-A thickness. If the visa is issued as a label, the increase in thickness once the label is attached to the passport visa page shall not exceed 0.19 mm (0.0075 in). The thickness of the area within the machine readable zone (MRZ) shall not vary by more than 0.05 mm (0.002 in). If a protective laminate is used, it is recommended that its thickness not exceed 0.15 mm (0.006 in).

General note.— The decimal notation used in these specifications conforms to ICAO practice. This differs from ISO practice where a decimal point (.) in imperial measurements and a comma (,) in metric measurements are used.

Placement of the MRV-A. The MRV-A shall be positioned as follows:

The MRV-A shall be located on the passport visa page such that the MRZ is coincident with and parallel to the outside edge (reference edge) of the passport visa page, and the left edge of the MRV-A is coincident with and parallel to the left edge of the passport visa page as defined in Appendix C, Section C.1.

The MRZ shall be located such that the two OCR lines contained therein are within the Effective Reading Zone (ERZ) as defined in Doc 9303-3.

Only one MRV-A shall be located on a passport visa page (see Appendix C, Section C.1).

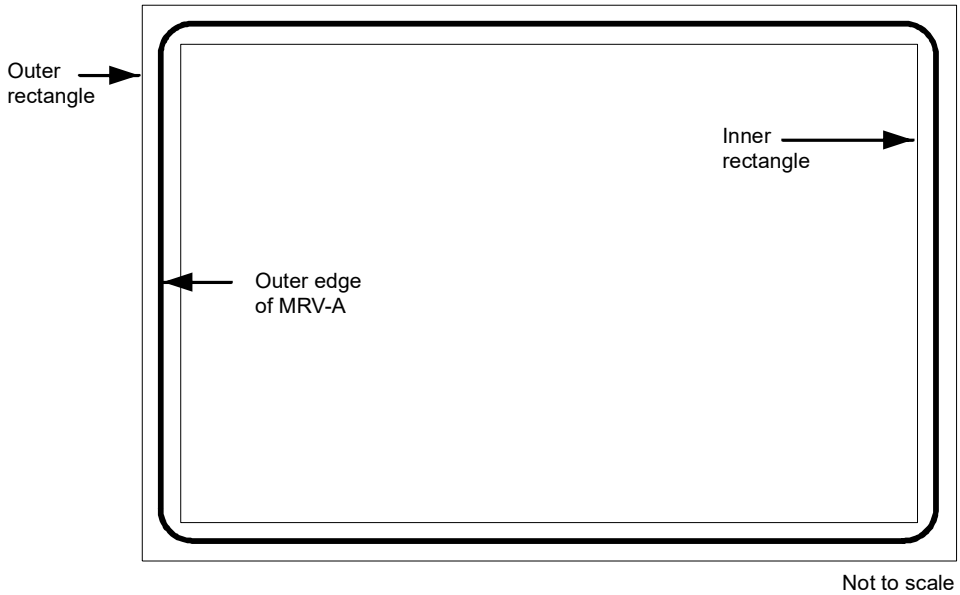


Figure 1. MRV-A dimensional illustration

3. GENERAL LAYOUT OF THE MRV-A

The MRV-A follows a standardized layout to facilitate reading of data globally, by visual and machine readable means, to accommodate the various requirements of States' laws and practices and to achieve the maximum standardization within those divergent requirements.

The standard layout incorporates space for a portrait of the holder and other identification feature(s). The inclusion of a portrait on a visa is strongly recommended in the interests of security, but States who are not yet able to apply portraits may fill this space with, for example, a national crest.

3.1 MRV-A Zones

An MRV-A is divided into six zones as follows:

Zone I	Mandatory header
Zone II	Mandatory and optional personal data elements
Zone III	Mandatory and optional document data elements
Zone IV	Signature (original or reproduction) or authentication
Zone V	Mandatory zone for identification feature (feature optional)
Zone VII	Mandatory machine readable zone (MRZ)

Note 1.— The signature in Zone IV of a visa is that of an issuing officer, not of the document holder. The signature may be replaced or accompanied by an official stamp.

Note 2.— To facilitate inspection of visas at border control, the layout of the visa presents Zone III above Zone II.

Note 3.— Zone VI is not available on an MRV issued in the form of a label.

Note 4.— Zones I to V constitute the Visual Inspection Zone (VIZ).

Zones I and VII are mandatory. Certain data in Zones II and III are also mandatory. The mandatory components of these four Zones represent the minimum data requirements for an MRV-A. The optional data elements in Zones II, III and V and in optional Zone IV may be utilized to accommodate the diverse requirements of States, while achieving the desired level of standardization. The data elements which may be included in the various zones and their order are set out in Section 4.4. Section 4.4 also illustrates the dimensional specifications and tolerances for the layout of the MRV-A and the technical specifications for the printing of data elements within the zones, as well as the guidelines for positioning and adjusting the dimensional specifications of Zones I to V to accommodate the flexibility desired by issuing States. Examples of personalized MRV-As are shown in Appendix A, Section A.1. Appendix B, Section B.1 illustrates the format for the presentation of the machine readable data in Zone VII.

3.2 Content, Use and Dimensional Flexibility of Zones

The data elements to be included in the zones, the treatment of the zones and guidelines for the dimensional layout of zones shall be as described hereunder.

Zone I identifies the issuing State and the type of document. These elements are mandatory. The order of the data elements in this zone is left to the discretion of the issuing State.

To facilitate the checking of visas by airline personnel and control authorities, the essential details of the visa document shall be entered in a standard sequence in Zone III while essential personal details of the holder shall be entered in a standard sequence in Zone II. On a visa, Zone III appears above Zone II.

Zone IV provides space for an optional signature or authentication. This is normally the signature of the issuing officer or an official stamp. The application of an official stamp elsewhere on the document is not precluded except that it must not intrude into the MRZ or affect the legibility of entered data.

Zone VII conforms in height to the MRZ defined for all MRTDs so that the machine readable data lines fall within the ERZ specified in Doc 9303-3, thus allowing a single reader to be used for all types and sizes of MRTDs.

All MRZ data elements are mandatory and shall be shown as defined in Section 4.2 even though an issuing State may choose not to include a specific MRZ data element in the VIZ.

3.3 Dimensional Flexibility of Zones I to V

Zones I to V may be adjusted in size and shape within the overall dimensional specifications of the MRV-A to accommodate the diverse requirements of issuing States. All zones, however, shall be bounded by straight lines, and all angles where straight lines join shall be right angles (i.e. 90 degrees). It is recommended that the zone boundaries not be printed on the MRV-A. The nominal position of the zones is shown in Section 4.4, Figure 4.

When an issuing State chooses to produce an MRV-A as a securely attached card containing a transparent or otherwise unprintable border around the card, the available area within the zones will be reduced. The full MRV-A dimensions and zone boundaries shall be measured from the outside edge of this border, which is the external edge of the MRV-A.

Zone I shall be adjacent and parallel to the top edge of the MRV-A and extend across the full 120.0 mm ± 1.0 mm (4.72 in ± 0.04 in) dimension. The issuing State may vary the *vertical* dimension of Zone I, as required, but this dimension shall be sufficient to allow legibility of the data elements in the zone, and the height shall not be greater than 12.0 mm (0.47 in) as defined in Section 4.4, Figure 4.

Zone V shall be located such that its left edge is coincident with the left edge of the MRV-A, as defined in Section 4.4, Figure 4. Zone V may vary in size but any variation from the nominal dimensions shall not exceed the tolerances specified in Section 4.4, Figure 4.

Zone V may move *vertically* along the left edge of the MRV-A and overlay a portion of Zone I as long as individual details contained in either zone are not obscured. Zone V may, as a result, have its *lower external boundary* coincident with the top edge of the MRZ of the MRV-A and its *upper external boundary* coincident with the top edge of the MRV-A.

The upper boundary of Zone III shall be coincident with the lower boundary of Zone I.

Zone III may extend to the full width of that portion of the MRV-A to the right of Zone V.

The lower boundary of Zone III (see Section 4.4, Figure 4) may be positioned at the discretion of the issuing State. Enough space shall be left for Zone II and Zone IV (when used) below the boundary.

Normally, the upper boundary of Zone II should be coincident with the lower boundary of Zone III. The boundary does not have to be straight across the 120.0 mm ± 1.0 mm (4.72 in ± 0.04 in) dimension of the visa. Zone II may also overlay a portion of Zone V for the MRV-A, if required. When this occurs, issuing States shall ensure that data contained in either zone are not obscured. See Appendix A, Section A.1, Figure A-2.

Zone IV, when included on the MRV-A, shall be entered on the right-hand side of the visa immediately above but not intruding into the MRZ. See Section 4.4, Figure 5.

4. DETAILED LAYOUT OF THE MRV-A

4.1 Visual Inspection Zone (VIZ) (Zones I-V)

All data in the VIZ shall be clearly legible.

Print spacing. The design of the MRV-A in Zones II and III is based on a vertical line spacing of a maximum of 8 lines per 25.4 mm (1.0 in) and a horizontal printing density of a maximum of 15 characters per 25.4 mm (1.0 in). This spacing has been chosen as the smallest in which information is clear and legible. If any optional field or data element is not used, the entered data may be spread out in the VIZ of the MRV-A consistent with the requirement for sequencing zones and data elements. This horizontal printing density and the font and the vertical line spacing may be adjusted at the discretion of each State, provided that in the VIZ all data shall be printed in a size such that they can be easily read and assimilated by a person with normal eyesight. Typical configurations are shown in Appendix A. Zone VII, the mandatory MRZ, shall be printed with a line spacing as defined in Section 4.4, Figure 3, and a horizontal printing density of 10 characters per 25.4 mm (1.0 in).

4.1.1 Data element directory

4.1.1.1 Visual inspection zone — Data element directory

Field/ zone no.	*Data element*	*Specifications*	*Maximum no. of character positions*	*References and notes**
01/I Mandatory	Issuing State	The State responsible for issuing the MRV-A. This shall be personalized, the type font being selected at the discretion of the issuing State. For transliteration rules, refer to Doc 9303-3.	Variable	Notes a, c, d, e, i.
02/I Mandatory	Document	The word or words in the language of the issuing State for the document (visa or other appropriate document) which confers on the holder that State's authority to travel to a port of entry in its territory.	Variable	Notes a, c, d, e, i.
03/III Mandatory	Place of issue	Post/location (usually a city) where the MRV-A is issued. A translation of the name into one or more languages, one of which should be English, French or Spanish, shall be given when the translated name is more familiar to the international community.	15	Notes a, b, c, i, k.
04/III Mandatory	Valid from (date)	In most cases this will be the date of issue of the MRV-A and indicates the first date from which the MRV-A can be used to seek entry. For some States the date of issue and the date the visa becomes valid may differ. In such cases the latter shall	8	Notes a, b, c, i, k.

Field/ zone no.	*Data element*	*Specifications*	*Maximum no. of character positions*	*References and notes**
		be indicated in this field and the date of issue may be shown in Field 09 (see below). For date format, refer to Doc 9303-3.		
05/III Mandatory	Valid until (date)	In most cases this will be the date of expiry of the MRV-A and indicates the last day on which the MRV-A can be used to seek entry. For some States this will be the date by or on which the holder should have left the country concerned. For date format, refer to Doc 9303-3.	8	Notes a, b, c, i, k.
06/III Mandatory	Number of entries	The number of entries for which the visa is valid.	8	Notes a, b, c, i, k.
07/III Mandatory	Document number	The number given to the visa by the issuing State.	13	Notes a, b, c, i, j, k.
08/III Mandatory	Type/class/ category	This field shall include one or more of the following elements: • the issuing State's indication of the type and/or class of visa granted in accordance with the law/practice of that State; • the broad categorization of the type of visa granted, e.g. visitor/resident/ temporary resident/student/diplomat, etc., in accordance with the law/practice of the issuing State; • any limitations on the territorial validity of the visa.	46	Notes a, b, c, i, k.
09/III Optional	Additional information	This field may include necessary endorsements as to entitlements which attach to the visa. The issuing State may also use this field to include a) the maximum authorized duration of stay; b) conditions related to the granting of the visa; c) date of issue if different from "Valid from" date; and d) record of any fees paid.		Note g.
10,11/II Mandatory	Name	See Doc 9303-3.	Variable	Notes a, c, i.

Field/ zone no.	*Data element*	*Specifications*	*Maximum no. of character positions*	*References and notes**
10/II Mandatory	Primary identifier	See Doc 9303-3.	Variable	Notes a, c, i, k.
11/II Optional	Secondary identifier	See Doc 9303-3.	Variable	Notes a, c, i.
12/II Optional	Passport number	The number of the passport or other travel document in which the MRV-A is placed.	Variable	Notes a, b, c, g, i, j.
13/II Optional	Sex	Sex of MRV-A holder, when included, is to be specified by use of the single initial commonly used in the language of the State of issue. If translation into English, French or Spanish is necessary, followed by an oblique and the capital letter F for female, M for male, or X for unspecified.	3	Note a, f, g.
14/II Optional	Date of birth	See Doc 9303-3.	9	Notes a, b, c, k.
15/II Optional	Nationality	See Doc 9303-3.	Variable	Notes a, h, k.
16/IV Optional	Signature or other authorization	An authorization which may be the signature of an issuing official and/or an official stamp.		
17/V Mandatory	Identification feature	This field shall be entered on the document and should contain a portrait of the holder. If included, the portrait shall have a size of 36.0 ± 4.0 mm × 29.0 ± 3.0 mm (1.42 ± 0.16 in × 1.14 ± 0.12 in) . If a State does not place an identification feature in this field, a national symbol or logo may be inserted instead. See Doc 9303-3 –- Section 3.9 for additional specifications for the portrait.		

* Notes can be found in the last portion of sub-section 4.2.2.2.

4.2 Machine Readable Zone (MRZ) (Mandatory Zone VII)

4.2.1 MRZ position, data elements, print specifications and print position in the MRZ

4.2.1.1 MRZ position

The MRZ is located at the bottom of the MRV-A. Section 4.4, Figure 3, shows the nominal position of the data in the MRZ.

4.2.1.2 Data elements

The data elements corresponding to Fields 01, 05, 10, 11, and 13 to 15 of the VIZ are mandatory in the MRZ and shall be printed in machine readable form in the MRZ, beginning with the leftmost character position in each field in the sequence indicated in the data structure specifications shown below. Appendix B, Section B.1, indicates the structure of the MRZ.

4.2.1.3 Print specifications

Machine readable data shall be printed in OCR-B type font, size 1, constant stroke width, as specified in Doc 9303-3. The MRZ shall be printed with the line spacing as defined in Section 4.4, Figure 3, and a horizontal printing density of 10 characters per 25.4 mm (1.0 in).

4.2.1.4 Print position

The position of the left-hand edge of the first character shall be 4.0 mm ± 1.0 mm (0.16 in ± 0.04 in) from the left-hand edge of the document. Reference centre lines for the two OCR lines and a nominal starting position for the first character of each line are shown in Section 4.4, Figure 3. The positioning of the characters is indicated by those reference lines and by the printing zones of the two code lines in Section 4.4, Figure 3.

4.2.2 Data Structure of Machine Readable Data for the MRV-A

4.2.2.1 Data structure of the upper machine readable line

MRZ field character positions (line 1)	*Field no in VIZ*	*Data element*	*Specifications*	*Number of characters*	*References and notes**
1 to 2		Type of document	Capital letter V to designate a machine readable visa. One additional character may be used, at the discretion of the issuing State, to designate a particular type of visa. If the second character position is not used for this purpose, it shall be filled by the filler character (<).	2	Notes a, b, c, e.

MRZ field character positions (line 1)	*Field no in VIZ*	*Data element*	*Specifications*	*Number of characters*	*References and notes**
3 to 5	1	Issuing State	See Doc 9303-3.	3	Notes a, c, e.
6 to 44	10, 11	Name	See Doc 9303-3.	39	Notes a, c, e.
		Punctuation in the name	Representation of punctuation is not permitted in the MRZ.		Doc 9303-3.
		Apostrophes in the name	Components of the primary or secondary identifiers separated by apostrophes shall be combined, and no filler character (<) shall be inserted. Example: VIZ: D'ARTAGNAN MRZ: `D A R T A G N A N`		Doc 9303-3.
		Hyphens in the name	Hyphens (-) in the name shall be converted to the filler character (<) (i.e. hyphenated names shall be represented as separate components). Example: VIZ: MARIE-ELISE MRZ: `M A R I E < E L I S E`		Doc 9303-3.
		Commas	When a comma is used in the VIZ to separate the primary and secondary identifiers, the comma shall be omitted in the MRZ and the primary and secondary identifiers shall be separated by two filler characters (<<). When a comma is used in the VIZ to separate two name components, it shall be represented in the MRZ by a single filler character (<).		Doc 9303-3.
		Name suffixes	Name suffixes (e.g. Jr., Sr., II or III) shall not be included in the MRZ except as permitted by Doc 9303–3 as components of the secondary identifier.		Doc 9303-3.
		Filler	When all components of the primary and secondary identifiers and required separators (filler characters) do not exceed 39 characters in total, all name components shall be included in the		

MRZ field character positions (line 1)	*Field no in VIZ*	*Data element*	*Specifications*	*Number of characters*	*References and notes**
			MRZ and all unused character positions shall be completed with filler characters (<) repeated up to position 44 as required.		
		Truncation of the name	When the primary and secondary identifiers and required separators (filler characters) exceed the number of character positions available for names (i.e. 39), they shall be truncated as follows: Characters shall be removed from one or more components of the primary identifier until three character positions are freed, and two filler characters (<<) and the first character of the first component of the secondary identifier can be inserted. The last character (position 44) shall be an alphabetic character (A through Z). This indicates that truncation may have occurred. Further truncation of the primary identifier may be carried out to allow characters of the secondary identifier to be included, provided that the name field shall end with an alphabetic character (position 44). This indicates that truncation may have occurred. When the name consists of only a primary identifier which exceeds the number of character positions available for the name, i.e. 39, characters shall be removed from one or more components of the name until the last character in the name field is an alphabetic character.		Doc 9303-3, Note a.

* Notes can be found in the last portion of sub-section 4.2.2.2.

4.2.2.2 Data structure of the lower machine readable line

MRZ character positions (line 2)	*Field no. in VIZ*	*Data element*	*Specifications*	*Number of characters*	*References and notes**
1 to 9	07 or 13	Passport or document number	At the discretion of the issuing State, either the passport number or the visa number shall be used in this field; however, the latter option can only be exercised where the visa number has 9 characters or fewer. Any special characters or spaces in the number shall be replaced by the filler character (<). The number shall be followed by the filler character (<) repeated up to position 9 as required.	9	Notes a, b, c, e, j.
10		Check digit	See Doc 9303-3.	1	Notes b, e.
11 to 13	16	Nationality	See Doc 9303-3.	3	Notes a, c, e, h.
14 to 19	15	Date of birth	See Doc 9303-3.	6	Notes b, c, e.
20		Check digit	See Doc 9303-3.	1	Note b.
21	14	Sex	F = Female; M = Male; < = non-specified.	1	Notes a, c, f, g.
22 to 27	5	Valid until (date)	In most cases this will be the date of expiry of the MRV-A and indicates the last day on which the MRV-A can be used to seek entry. For some States this will be the date by or on which the holder should have left.	6	Doc 9303-3; Notes b, e.
28		Check digit	See Doc 9303-3.	1	Note b.
29 to 44		Optional data elements	For optional use of the issuing State. Unused character positions shall be completed with the filler character (<) repeated up to position 44 as required.	16	Notes a, b, c, e.

* Notes:

a) Alphabetic characters (A–Z and a-z). National characters may be used in the VIZ. In the MRZ, only those characters specified in Doc 9303-3 shall be used.

b) Numeric characters (0–9). National numerals may be additionally included in the VIZ. In the MRZ, only the numerals 0–9 may be used as defined in Doc 9303-3.

c) Punctuation may be included in the VIZ. In the MRZ, only the filler character specified in Doc 9303-3 shall be used.

d) The lengths of fields 01 and 02 are undefined, depending on type font and limits set by MRV-A size and position of other fields.

e) The field caption is not printed on the document.

f) Where an issuing State or organization does not want to identify the sex, the filler character (<) shall be used in this field in the MRZ and an X in this field in the VIZ.

g) The use of a caption to identify a field is at the option of the issuing State.

h) United Nations Laissez-passer are issued to officials of the United Nations Organization under the terms of the *Convention on the Privileges and Immunities of the United Nations* of 13 February 1946 and to officials of the Specialized Agencies of the United Nations under the terms of the *Convention on the Privileges and Immunities of the Specialized Agencies of the United Nations* of 21 November 1947. In the case of visas entered in the United Nations Laissez-passer, in keeping with the international character of United Nations officials, nationality shall not be shown. Instead the appropriate code shall be entered in accordance with Doc 9303-3.

i) The number of characters (in the field length) includes any blank spaces.

j) The number of characters in the VIZ may be variable; however, if the document number has more than 9 characters, the 9 principal characters shall be shown in the MRZ in character positions 1 to 9.

k) The field caption shall be printed on the document.

4.2.3 Examples of Names of the Holder in the MRZ

Note.— In the following examples, the document is assumed to be a visa issued by the State of Utopia. The first five characters of the upper machine readable line are coded "V<UTO".

a) Usual representation:

Name: Anna Maria Eriksson
VIZ: ERIKSSON, ANNA MARIA
MRZ (upper line): `V<UTOERIKSSON<<ANNA<MARIA<<<<<<<<<<<<<<<<<<<<`

b) Central primary identifier:

Name: Deborah Heng Ming Lo
VIZ: HENG, DEBORAH MING LO
MRZ (upper line): `V<UTOHENG<<DEBORAH<MING<LO<<<<<<<<<<<<<<<<<<`

c) Hyphen as part of the name:

Name: Susie Margaret Smith-Jones
VIZ: SMITH-JONES, SUSIE MARGARET
MRZ (upper line): `V<UTOSMITH<JONES<<SUSIE<MARGARET<<<<<<<<<<<<`

d) Apostrophe as part of the name:

Name: Enya Siobhan O'Connor
VIZ: O'CONNOR, ENYA SIOBHAN
MRZ (upper line): `V<UTOOCONNOR<<ENYA<SIOBHAN<<<<<<<<<<`

e) Multiple name components:

Name: Martin Van Der Muellen
VIZ: VAN DER MUELLEN, MARTIN
MRZ (upper line): `V<UTOVAN<DER<MUELLEN<<MARTIN<<<<<<<<<<<<<<<<`

f) No secondary identifier:

Name: Arkfreith
VIZ: ARKFREITH
MRZ (upper line): `V<UTOARKFREITH<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<`

4.2.3.1 Truncated names — Secondary identifier truncated

a) One or more name components truncated to initials:

Name: Nilavadhanananda Chayapa Dejthamrong Krasuang
VIZ: NILAVADHANANANDA, CHAYAPA DEJTHAMRONG KRASUANG
MRZ (upper line): `V<UTONILAVADHANANANDA<<CHAYAPA<DEJTHAMRONG<K`

b) One or more name components truncated:

Name: Nilavadhanananda Arnpol Petch Charonguang
VIZ: NILAVADHANANANDA, ARNPOL PETCH CHARONGUANG
MRZ (upper line): `V<UTONILAVADHANANANDA<<ARNPOL<PETCH<CHARONGU`

4.2.3.2 Truncated names — Primary identifier truncated

a) One or more components truncated to initials:

Name: Dingo Potoroo Bennelong Wooloomooloo Warrandyte Warnambool
VIZ: BENNELONG WOOLOOMOOLOO WARRANDYTE WARNAMBOOL, DINGO POTOROO
MRZ (upper line): `V<UTOBENNELONG<WOOLOOMOOLOO<WARRANDYTE<W<<DI`

b) One or more components truncated:

Name: Dingo Potoroo Bennelong Wooloomooloo Warrandyte Warnambool
VIZ: BENNELONG WOOLOOMOOLOO WARRANDYTE WARNAMBOOL, DINGO POTOROO
MRZ (upper line): `V<UTOBENNELONG<WOOLOOM<WARRAND<WARNAM<<DINGO`

c) One or more components truncated to a fixed number of characters:

Name: Dingo Potoroo Bennelong Wooloomooloo Warrandyte Warnambool
VIZ: BENNELONG WOOLOOMOOLOO WARRANDYTE WARNAMBOOL, DINGO POTOROO
MRZ (upper line): V<UTOBENNEL<WOOLOO<WARRAN<WARNAM<<DINGO<POTO

4.2.3.3 Names that just fit, indicating possible truncation by letter in the last position of the name field, but which are not truncated

Name: Jonathon Warren Trevor Papandropoulous
VIZ: PAPANDROPOULOUS, JONATHON WARREN TREVOR
MRZ (upper line): V<UTOPAPANDROPOULOUS<<JONATHON<WARREN<TREVOR

Note.— Even though there is an alphabetic character in the 44th character position of this MRV-A upper machine readable line, this name has not been truncated but it shall be assumed that it has been truncated.

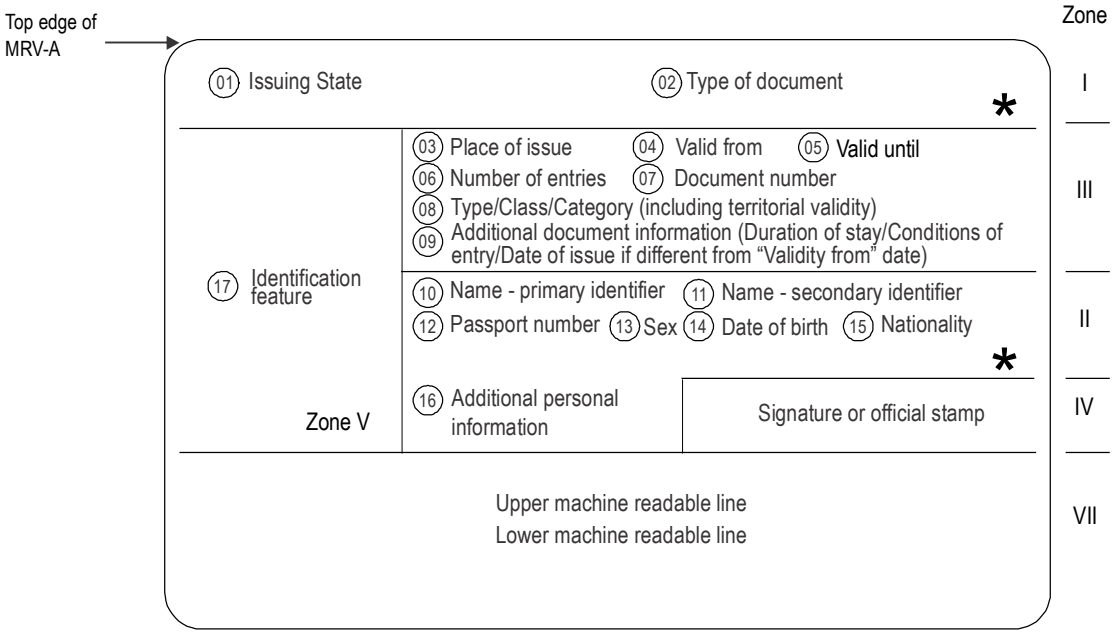
4.3 Portrait

Portrait. For the MRV-A, a portrait should be inserted in the rectangular area defined as Zone V. Such portrait, if included, shall represent only the holder of the MRV-A.

Portrait edges. The portrait may have irregular edges. When a digitally printed reproduction is used, the background of the portrait may be dropped out in order to provide protection against forgery or substitution.

Zone V without an identification feature. A standard default image, such as a national symbol, crest or wording, should be selected and used in Zone V when an identification feature is not included.

4.4 MRV-A Diagrams



* Optional control number – to be preprinted at the discretion of the issuing State either horizontally where shown in Zone I or in Zone II or vertically anywhere along the right-hand edge of Zone V (where present).

Figure 2. Location of data elements on an MRV-A

Note 1.— VIZ based on maximum printing density of 8 lines per 25.4 mm (1.0 in) and horizontal printing density of 15 characters per 25.4 mm (1.0 in).

Note 2.— MRZ based on horizontal printing of 10 characters per 25.4 mm (1.0 in).

Note 3.— ◯ = field numbers.

Note 4.— The borderlines of the zones are not printed on the actual visa.

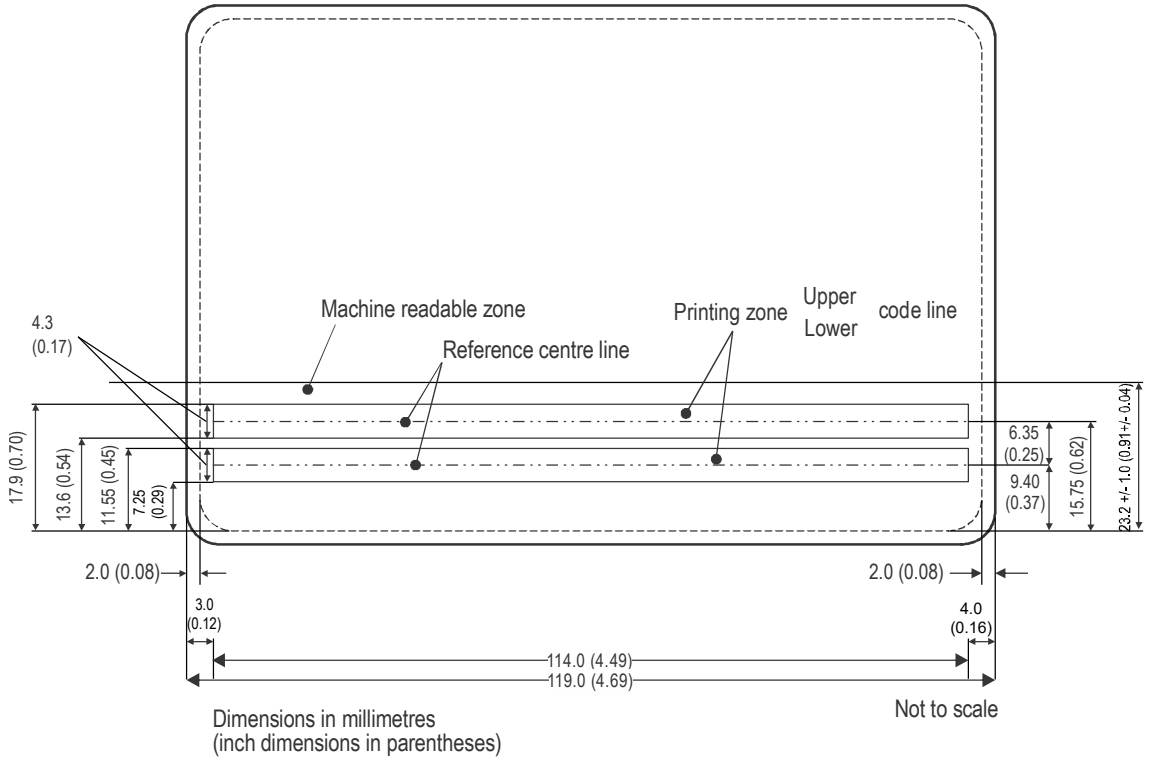


Figure 3. Schematic diagram of the Machine Readable Zone of an MRV-A

Note.— For illustration purposes, the smallest option for the 120.0 mm (4.72 in) dimension of the MRV-A and the smallest option for the left-hand margin in the MRZ have been selected.

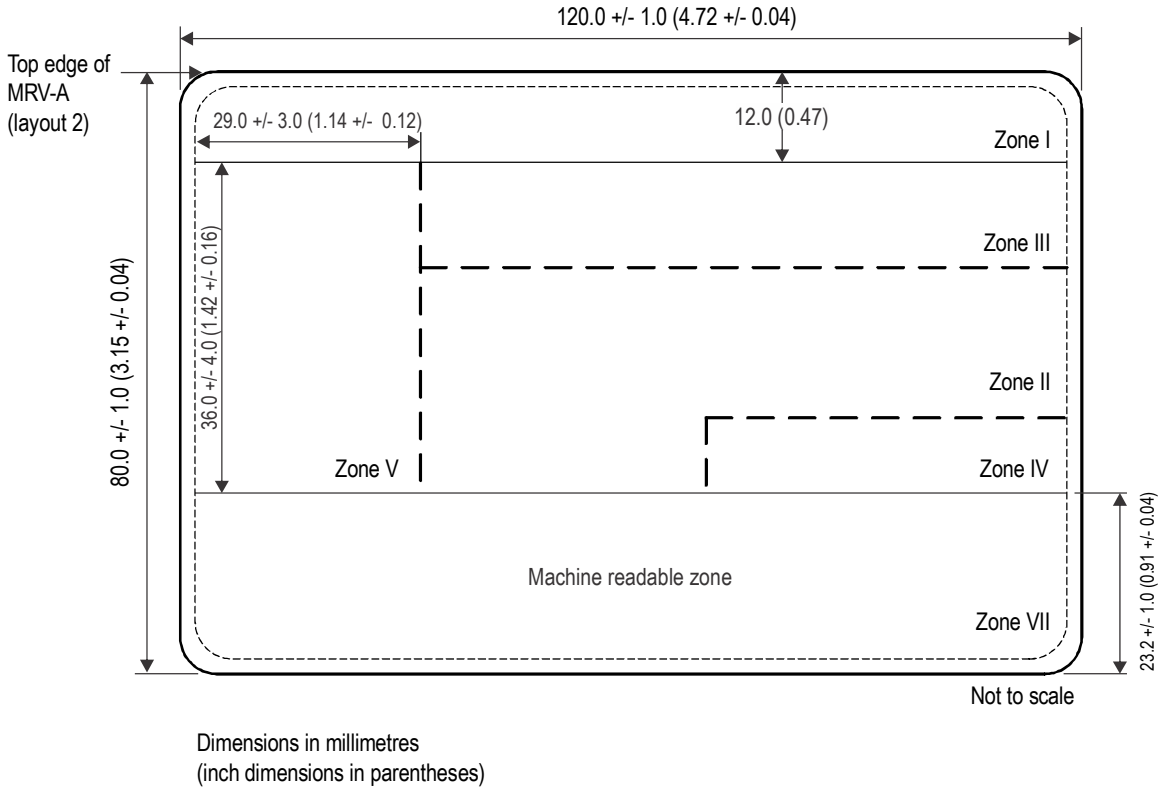


Figure 4. Nominal positioning of zones on an MRV-A

This diagram should be considered in conjunction with Section 3.3. It assumes that all the available space for data in the VIZ is used. The line spacing in the VIZ is the closest permitted at 8 lines per 25.4 mm (1.0 in). If an issuing State requires less information, the line spacing can be increased to print fewer lines in the VIZ.

Dotted lines indicate zone boundaries whose positions are not fixed, enabling issuing States flexibility in the presentation of data.

The dimensions of the identification feature (normally a portrait) shall be between a minimum of 32.0 mm × 26.0 mm (1.26 in × 1.02 in) and a maximum of 40.0 mm × 32.0 mm (1.57 in × 1.26 in). An issuing State may elect to issue an MRV in this format without an identification feature, replacing it with a crest or symbol.

Though the portrait position is defined as a rectangular area, it may have irregular edges or, if the portrait is digitally printed, have the background dropped out. Such techniques may be used to provide protection against fraudulent alteration.

Affixed photographs (even if protected by a laminate) shall not be applied. Identification features shall be personalized.

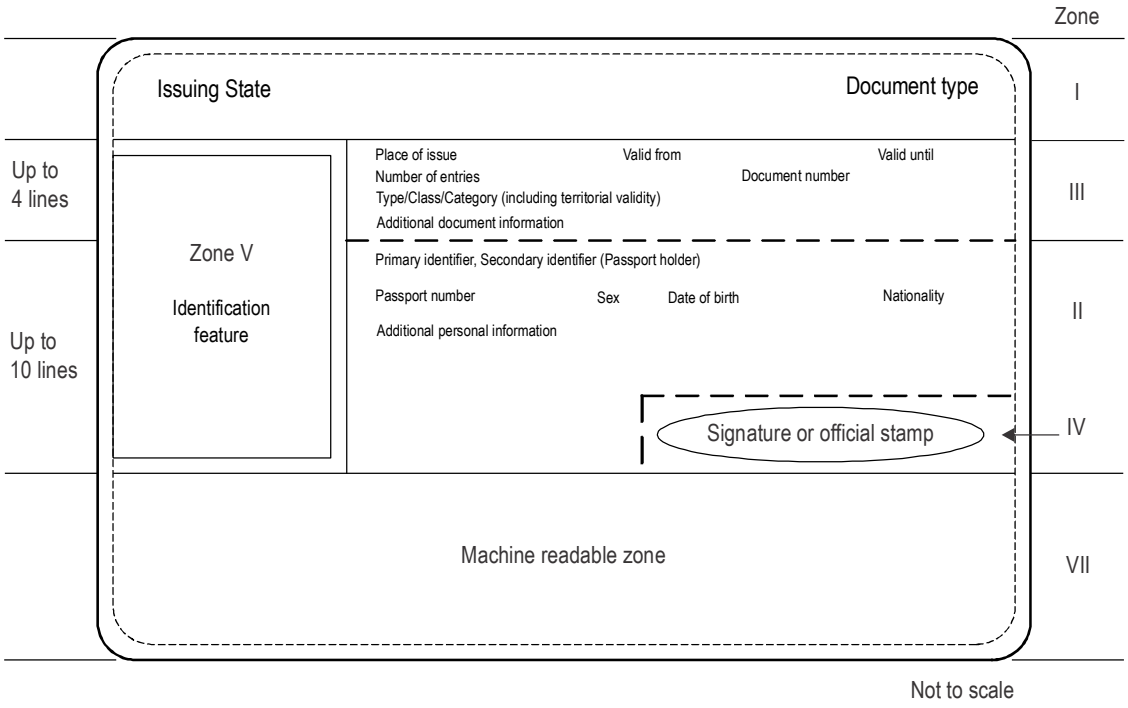


Figure 5. Data elements on an MRV-A

Note 1.— Broken lines indicate zone borders whose position may be adjusted by the issuing State to optimize the presentation of the data. Solid lines indicate fixed zone borders. Zone border lines are not printed on the documents.

Note 2.— Provided it is contained within the rectangular area, the identification feature may have irregular edges.

Note 3.— An issuing State may elect to issue a visa with the identification feature replaced by a crest or symbol.

5. TECHNICAL SPECIFICATIONS FOR FORMAT-B MACHINE READABLE VISAS (MRV-B)

This section defines the specifications which are unique to Format-B machine readable visas (MRV-B) and are necessary for global interoperability. Specifications are included for the discretionary expansion of the machine readable data capacity of the MRV beyond that defined for global interchange. The MRV-B is suitable for use by States who wish to maintain a clear area on the passport visa page adjacent to the visa, so as to allow a seal to be placed on the visa and the passport page on which it is affixed.

5.1 Dimensions and Placement of the MRV-B

The dimensions and placement of the MRV-B shall be as follows:

MRV-B nominal dimensions. The nominal dimensions of the MRV-B are based on ISO/IEC 7810, ID-2 Type Card as follows:

74.0 mm × 105.0 mm (2.91 in × 4.13 in)

MRV-B margins. The dimensional specifications refer to the outer limits of the MRV-B. A margin of 2.0 mm (0.08 in) along each outer edge, with the exception of the header zone, must be left clear of data.

MRV-B edge tolerances. The edges of the MRV-B shall be within the area circumscribed by the concentric rectangles as illustrated in Figure 6.

Inner rectangle: 73.0 mm × 104.0 mm (2.87 in × 4.09 in)
Outer rectangle: 75.0 mm × 106.0 mm (2.95 in × 4.17 in)

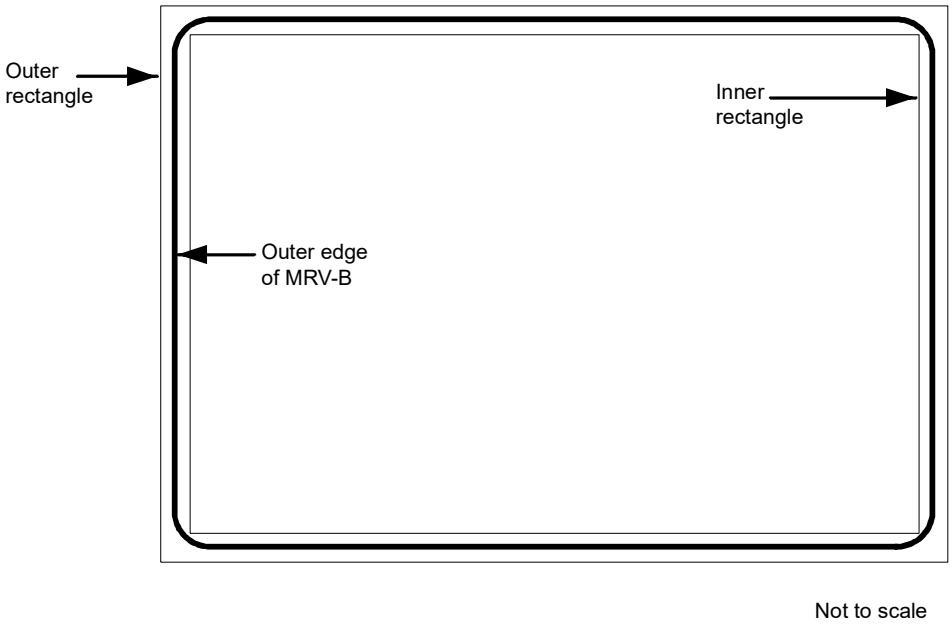


Figure 6. MRV-B dimensional illustration

MRV-B thickness. If the visa is issued as a label, the increase in thickness once the label is attached to the passport visa page shall not exceed 0.19 mm (0.0075 in). The thickness of the area within the machine readable zone (MRZ) shall not vary by more than 0.05 mm (0.002 in). If a protective laminate is used, it is recommended that its thickness not exceed 0.15 mm (0.006 in).

General note.— The decimal notation used in these specifications conforms to ICAO practice. This differs from ISO practice where a decimal point (.) in imperial measurements and a comma (,) in metric measurements is used.

Placement of the MRV-B. The MRV-B shall be positioned as follows:

The MRV-B shall be located on the passport visa page such that the MRZ is coincident with and parallel to the outside edge (*reference edge*) of the passport visa page, and the left edge of the MRV-B is coincident with and parallel to the left edge of the passport visa page as defined in Appendix C, Section C.2.

The MRZ shall be located such that the two OCR lines contained therein are within the Effective Reading Zone (ERZ) as defined in Doc 9303-3.

Only one MRV-B shall be located on a passport visa page (see Appendix C, Section C.2).

6. GENERAL LAYOUT OF THE MRV-B

The MRV-B follows a standardized layout to facilitate reading of data globally, by visual and machine readable means, to accommodate the various requirements of States' laws and practices and to achieve the maximum standardization within those divergent requirements.

The standard layout incorporates space for a portrait of the holder and other identification feature(s). The inclusion of a portrait on a visa is strongly recommended in the interests of security, but States that are not yet able to apply portraits may fill this space with, for example, a national crest.

6.1 MRV-B Zones

An MRV-B is divided into six zones as follows:

Zone I	Mandatory header
Zone II	Mandatory and optional personal data elements
Zone III	Mandatory and optional document data elements
Zone IV	Signature (original or reproduction) or authentication
Zone V	Mandatory zone for identification feature (feature optional)
Zone VII	Mandatory machine readable zone (MRZ)

Note 1.— The signature in Zone IV of a visa is that of an issuing officer, not of the document holder. The signature may be replaced or accompanied by an official stamp.

Note 2.— To facilitate inspection of visas at border control, the layout of the visa presents Zone III above Zone II.

Note 3.— Zone VI is not available on an MRV issued in the form of a label.

Note 4.— Zones I to V constitute the Visual Inspection Zone (VIZ).

Zones I and VII are mandatory. Certain data in Zones II and III are also mandatory. The mandatory components of these four Zones represent the minimum data requirements for an MRV-B. The optional data elements in Zones II, III and V and in optional Zone IV may be utilized to accommodate the diverse requirements of States, while achieving the desired level of standardization. The data elements which may be included in the various zones and their order are set out in Section 7.4. Section 7.4 also illustrates the dimensional specifications and tolerances for the two layouts of the MRV-B and the technical specifications for the printing of data elements within the zones, as well as the guidelines for positioning and adjusting the dimensional specifications of Zones I to V to accommodate the flexibility desired by issuing States. Examples of personalized MRV-Bs are shown in Appendix A, Section A.2. Appendix B, Section B.2 illustrates the format for the presentation of the machine readable data in Zone VII.

6.2 Content, Use and Dimensional Flexibility of Zones

The data elements to be included in the zones, the treatment of the zones and guidelines for the dimensional layout of zones shall be as described hereunder.

Zone I identifies the issuing State and the type of document. These elements are mandatory. The order of the data elements in this zone is left to the discretion of the issuing State.

To facilitate the checking of visas by airline personnel and control authorities, the essential details of the visa document shall be entered in a standard sequence in Zone III while essential personal details of the holder shall be entered in a standard sequence in Zone II. On a visa, Zone III appears above Zone II.

Zone IV provides space for an optional signature or authentication. This is normally the signature of the issuing officer or an official stamp. The application of an official stamp elsewhere on the document is not precluded except that it must not intrude into the MRZ or affect the legibility of entered data.

Zone VII conforms in height to the MRZ defined for all MRTDs so that the machine readable data lines fall within the ERZ specified in Doc 9303-3, thus allowing a single reader to be used for all types and sizes of MRTDs.

All MRZ data elements are mandatory and shall be shown as defined in Section 7.2 even though an issuing State may choose not to include a specific MRZ data element in the VIZ.

6.3 Dimensional Flexibility of Zones I to V

Zones I to V may be adjusted in size and shape within the overall dimensional specifications of the MRV-B to accommodate the diverse requirements of issuing States. All zones, however, shall be bounded by straight lines, and all angles where straight lines join shall be right angles (i.e. 90 degrees). It is recommended that the zone boundaries not be printed on the MRV-B. The nominal position of the zones is shown in Section 7.4, Figure 9.

When an issuing State chooses to produce an MRV-B as a securely attached card containing a transparent or otherwise unprintable border around the card, the available area within the zones will be reduced. The full MRV-B dimensions and zone boundaries shall be measured from the outside edge of this border, which is the external edge of the MRV-B.

Zone I shall be adjacent and parallel to the top edge of the MRV-B and extend across the full 105.0 mm ± 1.0 mm (4.13 in ± 0.04 in) dimension. The issuing State may vary the *vertical* dimension of Zone I, as required, but the dimension shall be sufficient to allow legibility of the data elements, and the height shall not be greater than 12.0 mm (0.47 in) as defined in Section 7.4, Figure 9.

Zone V shall be located such that its left edge is coincident with the left edge of the MRV-B, as defined in Section 7.4, Figure 9. Zone V may vary in size but any variation from the nominal dimensions shall not exceed the tolerances specified in Section 7.4, Figure 9.

Zone V may move *vertically* along the left edge of the MRV-B and overlay a portion of Zone I as long as individual details contained in either zone are not obscured. Zone V may, as a result, have its *lower external boundary* coincident with the top edge of the MRZ of the MRV-B and its *upper external boundary* coincident with the top edge of the MRV-B.

The upper boundary of Zone III shall be coincident with the lower boundary of Zone I.

Zone III may extend to the full width of that portion of the MRV-B to the right of Zone V.

The lower boundary of Zone III (see Section 7.4, Figure 9) may be positioned at the discretion of the issuing State. Enough space shall be left for Zone II and Zone IV (when used) below the boundary. The boundary does not need to be straight across the 105.0 mm ± 1.0 mm (4.13 in ± 0.04 in) dimension of the MRV-B.

Normally, the upper boundary of Zone II should be coincident with the lower boundary of Zone III. The boundary does not have to be straight across the 105.0 mm ± 1.0 mm (4.13 in ± 0.04 in) dimension of the visa. Zone II may also overlay a portion of Zone V for the MRV-B if required. When this occurs, issuing States shall ensure that data contained in either zone are not obscured. See Appendix A, A.2.

Zone IV, when included on the MRV-B, shall be entered on the right hand side of the visa immediately above but not intruding into the MRZ. See Section 7.4, Figure 9.

7. DETAILED LAYOUT OF THE MRV-B

7.1 Visual Inspection Zone (VIZ) (Zones I-V)

All data in the VIZ shall be clearly legible.

Print spacing. The design of the MRV-B in Zones II and III is based on a vertical line spacing of a maximum of 8 lines per 25.4 mm (1.0 in) and a horizontal printing density of a maximum of 15 characters per 25.4 mm (1.0 in). This spacing has been chosen as the smallest in which information is clear and legible. If any optional field or data element is not used, the entered data may be spread out in the VIZ of the MRV-B consistent with the requirement for sequencing zones and data elements. This horizontal printing density and the font and the vertical line spacing may be adjusted at the discretion of each State, provided that in the VIZ all data shall be printed in a size such that they can be easily read and assimilated by a person with normal eyesight. Typical configurations are shown in Appendix A, A.2. Zone VII, the mandatory MRZ, shall be printed with a line spacing as defined in Section 7.4, Figure 8, and a horizontal printing density of 10 characters per 25.4 mm (1.0 in).

7.1.1 Data element directory

7.1.1.1 Visual inspection zone — Data element directory

Field/ zone no.	*Data element*	*Specifications*	*Maximum no. of character positions*	*References and notes**
01/I Mandatory	Issuing State	The State responsible for issuing the MRV-B. This shall be personalized, the type font being selected at the discretion of the issuing State. For transliteration rules, refer to Doc 9303-3.	Variable	Notes a, c, d, e, i.
02/I Mandatory	Document	The word or words in the language of the issuing State for the document (visa or other appropriate document) which confers on the holder that State's authority to travel to a port of entry in its territory.	Variable	Notes a, c, d, e, i.
03/III Mandatory	Place of issue	Post/location (usually a city) where the MRV-B is issued. A translation of the name into one or more languages, one of which should be English, French or Spanish, shall be given when the translated name is more familiar to the international community.	15	Notes a, b, c, i, k.
04/III Mandatory	Valid from (date)	In most cases this will be the date of issue of the MRV-B and indicates the first date from which the MRV-B can be used to seek entry. For some States the date of issue and the date the visa becomes valid may differ. In such cases the latter shall be indicated in this field and the date of issue may be shown in Field 09 (see below). Date formats are specified in 9303-3.	8	Notes a, b, c, i, k.
05/III Mandatory	Valid until (date)	In most cases this will be the date of expiry of the MRV-B and indicates the last day on which the visa can be used to seek entry. For some States this will be the date by or on which the holder should have left the country concerned. Date formats are specified in 9303-3.	8	Notes a, b, c, i, k.
06/III Mandatory	Number of entries	The number of entries for which the visa is valid.	8	Notes a, b, c, i, k.

Field/ zone no.	*Data element*	*Specifications*	*Maximum no. of character positions*	*References and notes**
07/III Mandatory	Document number	The number given to the visa by the issuing State.	13	Notes a, b, c, i, j, k.
08/III Mandatory	Type/class/ category	This field shall include one or more of the following elements: • the issuing State's indication of the type and/or class of visa granted in accordance with the law/practice of that State; • the broad categorization of the type of visa granted, e.g. visitor/resident/ temporary resident/student/diplomat, etc., in accordance with the law/practice of the issuing State; • any limitations on the territorial validity of the visa.	46	Notes a, b, c, i, k.
09/III Optional	Additional information	This field may include necessary endorsements as to entitlements which attach to the visa. The issuing State may also use this field to include a) the maximum authorized duration of stay; b) conditions related to the granting of the visa; c) date of issue if different from "Valid from" date; and d) record of any fees paid.		Note g.
10,11/II Mandatory	Name	See Doc 9303-3.	Variable	Notes a, c, i, k.
10/II Mandatory	Primary identifier	See Doc 9303-3.	Variable	Notes a, c, i, k.
11/II Optional	Secondary identifier	See Doc 9303-3.	Variable	Notes a, c, i.
12/II Optional	Passport number	The number of the passport or other travel document in which the MRV-B is placed.	Variable	Notes a, b, c, g, i, j.

Field/ zone no.	*Data element*	*Specifications*	*Maximum no. of character positions*	*References and notes**
13/II Optional	Sex	Sex of MRV-B holder, when included, is to be specified by use of the single initial commonly used in the language of the State of issue. If translation into English, French or Spanish is necessary, followed by an oblique and the capital letter F for female, M for male, or X for unspecified.	3 Fixed	Notes a, f, g.
14/II Optional	Date of birth	See Doc 9303-3.	9	Notes a, b, c, k.
15/II Optional	Nationality	See Doc 9303-3.	Variable	Notes a, h, k.
16/IV Optional	Signature or other authorization	An authorization which may be the signature of an issuing official or an official stamp.		
17/V Mandatory	Identification feature	This field shall appear on the document and should contain a portrait of the holder. If included, the portrait shall have a nominal size of 35.5 ± 3.5 mm (1.40 ± 0.14 in) × 28.5 ± 2.5 mm (1.12 ± 0.1 in). If a State does not place an identification feature in this field, a national symbol or logo may be inserted instead. See Doc 9303-3, Section 3.9 for additional specifications for the portrait.		Note e.

* Notes can be found in the last portion of sub-section 7.2.2.2.

7.2 Machine Readable Zone (MRZ) (Mandatory Zone VII)

7.2.1 MRZ position, data elements, print specifications and print position in the MRZ

7.2.1.1 MRZ position

The MRZ is located at the bottom of the MRV-B. Section 7.4, Figure 8, shows the nominal position of the data in the MRZ.

7.2.1.2 Data elements

The data elements corresponding to Fields 01, 05, 10, 11, and 13 to 15 of the VIZ are mandatory in the MRZ and shall be printed in machine readable form in the MRZ, beginning with the leftmost character position in each field in the sequence indicated in the data structure specifications shown below. Appendix B, Section B.2, indicates the structure of the MRZ.

7.2.1.3 Print specifications

Machine readable data shall be printed in OCR-B type font, size 1, constant stroke width, as specified in Doc 9303-3. The MRZ shall be printed with the line spacing as defined in Section 7.4, Figure 8, and a horizontal printing density of 10 characters per 25.4 mm (1.0 in).

7.2.1.4 Print position

The position of the left-hand edge of the first character shall be 4.0 mm ± 1.0 mm (0.16 in ± 0.04 in) from the left-hand edge of the document. Reference centre lines for the two OCR lines and a nominal starting position for the first character of each line are shown in Section 7.4, Figure 8. The positioning of the characters is indicated by those reference lines and by the printing zones of the two code lines in Section 7.4, Figure 8 .

7.2.2 Data Structure of Machine Readable Data for the MRV-B

7.2.2.1 Data structure of the upper machine readable line

MRZ field character positions (line 1)	*Field no. in VIZ*	*Data element*	*Specifications*	*Number of characters*	*References and notes**
1 to 2		Type of document	Capital letter V to designate an MRV. One additional character may be used, at the discretion of the issuing State, to designate a particular type of visa. If the second character position is not used for this purpose, it shall be filled by the filler character (<).	2	Notes a, b, c, e.
3 to 5	1	Issuing State	See Doc 9303-3.	3	Notes a, c, e.
6 to 36	10, 11	Name	See Doc 9303-3.	31	Notes a, c, e.
		Punctuation in the name	Representation of punctuation is not permitted in the MRZ.		Doc 9303-3.

MRZ field character positions (line 1)	*Field no. in VIZ*	*Data element*	*Specifications*	*Number of characters*	*References and notes**
		Apostrophes in the name	Components of the name in the VIZ, separated by apostrophes shall be combined, and no filler character (<) shall be inserted. *Example:* VIZ: D'ARTAGNAN MRZ: `DARTAGNAN`		Doc 9303-3.
		Hyphens in the name	Hyphens (-) in the name shall be converted to the filler character (<) (i.e. hyphenated names shall be represented as separate components). *Example:* VIZ: MARIE-ELISE MRZ: `MARIE<ELISE`		Doc 9303-3.
		Commas	When a comma is used in the VIZ to separate the primary and secondary identifiers, the comma shall be omitted in the MRZ and the primary and secondary identifiers shall be separated by two filler characters (<<). When a comma is used in the VIZ to separate two name components, it shall be represented in the MRZ by a single filler character (<).		Doc 9303-3.
		Name suffixes	Name suffixes (e.g. Jr., Sr., II or III) shall not be included in the MRZ except as permitted by Doc 9303-3 as components of the secondary identifier.		Doc 9303-3.
		Filler	When all components of the primary and secondary identifiers and required separators (filler characters) do not exceed 31 characters in total, all name components shall be included in the MRZ and all unused character positions shall be completed with filler characters (<) repeated up to position 36 as required.		

MRZ field character positions (line 1)	*Field no. in VIZ*	*Data element*	*Specifications*	*Number of characters*	*References and notes**
		Truncation of the name	When the primary and secondary identifiers and required separators (filler characters) exceed the number of character positions available for names (i.e. 31), they shall be truncated as follows: Characters shall be removed from one or more components of the primary identifier until three character positions are freed, and two filler characters (<<) and the first character of the first component of the secondary identifier can be inserted. The last character (position 36) shall be an alphabetic character (A through Z). This indicates that truncation may have occurred. Further truncation of the primary identifier may be carried out to allow characters of the secondary identifier to be included, provided that the name field shall end with an alphabetic character (position 36). This indicates that truncation may have occurred. When the name consists of only a primary identifier which exceeds the number of character positions available for the name, i.e. 31, characters shall be removed from one or more components of the name until the last character in the name field is an alphabetic character.		Doc 9303-3, Notes a, c, e.

* Notes can be found in the last portion of sub-section 7.2.2.2.

7.2.2.2 Data structure of the lower machine readable line

MRZ field character positions (line 2)	*Field no. in VIZ*	*Data element*	*Specifications*	*Number of characters*	*References and notes**
1 to 9	07 or 12	Passport or document number	At the discretion of the issuing State, either the passport number or the visa number shall be used in this field; however, the latter option can only be exercised where the visa number has 9 characters or fewer. Any special characters or spaces in the number shall be replaced by the filler character (<). The number shall be followed by the filler character (<) repeated up to position 9 as required.	9	Notes a, b, c, e, j.
10		Check digit	See Doc 9303-3.	1	Notes b, e.
11 to 13	15	Nationality	See Doc 9303-3.	3	Notes a, c, e, h.
14 to 19	14	Date of birth	See Doc 9303-3.	6	Notes b, c, e.
20		Check digit	See Doc 9303-3.	1	Note b.
21	13	Sex	F = Female; M = Male; < = non-specified.	1	Notes a, c, f, g.
22 to 27	5	Valid until (date)	In most cases this will be the date of expiry of the MRV-B and indicates the last day on which the visa can be used to seek entry. For some States this will be the date by or on which the holder should have left. Date formats are specified in 9303-3.	6	Notes b, e.
28		Check digit	See Doc 9303-3.	1	Note b.
29 to 36		Optional data elements	For optional use of the issuing State. Unused character positions shall be completed with the filler character (<) repeated up to position 36 as required.	8	Notes a, b, c, e.

* Notes:

a) Alphabetic characters (A–Z). National characters may be used in the VIZ. In the MRZ, only those characters specified in Doc 9303-3 shall be used.

b) Numeric characters (0–9). National numerals may be used in the VIZ. In the MRZ, only those characters specified in Doc 9303-3 shall be used.

c) Punctuation or other special characters may be used in the VIZ. In the MRZ, only the filler character specified in Doc 9303-3 shall be used.

d) The lengths of fields 01 and 02 are undefined, depending on type font and limits set by MRV-B size and position of other fields.

e) The field caption is not printed on the document.

f) Where an issuing State or organization does not want to identify the sex, the filler character (<) shall be used in this field in the MRZ and an X in this field in the VIZ.

g) The use of a caption to identify a field is at the option of the issuing State.

h) United Nations Laissez-passer are issued to officials of the United Nations Organization under the terms of the *Convention on the Privileges and Immunities of the United Nations* of 13 February 1946 and to officials of the Specialized Agencies of the United Nations under the terms of the *Convention on the Privileges and Immunities of the Specialized Agencies of the United Nations* of 21 November 1947. In the case of visas entered in the United Nations Laissez-passer, in keeping with the international character of United Nations officials, nationality shall not be shown. Instead the appropriate code shall be entered in accordance Doc 9303-3.

i) The number of characters (in the field length) includes any blank spaces.

j) The number of characters in the VIZ may be variable; however, if the document number has more than 9 characters, the 9 principal characters shall be shown in the MRZ in character positions 1 to 9.

k) The field caption shall be printed on the document.

7.2.3 Examples of Names of the Holder in the MRZ

Note.— In the following examples, the document is assumed to be a visa issued by the State of Utopia. The first five characters of the upper machine readable line are coded "V<UTO".

a) Usual representation:

Name: Anna Maria Eriksson
VIZ: ERIKSSON, ANNA MARIA
MRZ (upper line): `V<UTOERIKSSON<<ANNA<MARIA<<<<<<<<<<<`

b) Central primary identifier:

Name: Deborah Heng Ming Lo
VIZ: HENG, DEBORAH MING LO
MRZ (upper line): `V<UTOHENG<<DEBORAH<MING<LO<<<<<<<<<<`

c) Hyphen as part of the name:

Name: Susie Margaret Smith-Jones
VIZ: SMITH-JONES, SUSIE MARGARET
MRZ (upper line): V<UTOSMITH<JONES<<SUSIE<MARGARET<<<<

d) Apostrophe as part of the name:

Name: Enya Siobhan O'Connor
VIZ: O'CONNOR, ENYA SIOBHAN
MRZ (upper line): V<UTOOCONNOR<<ENYA<SIOBHAN<<<<<<<<<<

e) Multiple name components:

Name: Martin Van Der Muellen
VIZ: VAN DER MUELLEN, MARTIN
MRZ (upper line): V<UTOVAN<DER<MUELLEN<<MARTIN<<<<<<<<

f) No secondary identifier:

Name: Arkfreith
VIZ: ARKFREITH
MRZ (upper line): V<UTOARKFREITH<<<<<<<<<<<<<<<<<<<<<<

7.2.3.1 Truncated names — Secondary identifier truncated

a) One or more name components truncated to initials:

Name: Nilavadhanananda Chayapa Dejthamrong Krasuang
VIZ: NILAVADHANANANDA, CHAYAPA DEJTHAMRONG KRASUANG
MRZ (upper line): V<UTONILAVADHANANANDA<<CHAYAPA<DEJ<K

b) One or more name components truncated:

Name: Nilavadhanananda Arnpol Petch Charonguang
VIZ: NILAVADHANANANDA, ARNPOL PETCH CHARONGUANG
MRZ (upper line): V<UTONILAVADHANANANDA<<ARNP<PE<CHARO

7.2.3.2 Truncated names — Primary identifier truncated

a) One or more components truncated to initials:

Name: Dingo Potoroo Bennelong Wooloomooloo Warrandyte Warnambool
VIZ: BENNELONG WOOLOOMOOLOO WARRANDYTE WARNAMBOOL, DINGO POTOROO
MRZ (upper line): V<UTOBENNELONG<WOOLOOMOOLOO<WAR<W<<D

b) One or more components truncated:

Name: Dingo Potoroo Bennelong Wooloomooloo Warrandyte Warnambool
VIZ: BENNELONG WOOLOOMOOLOO WARRANDYTE WARNAMBOOL, DINGO POTOROO
MRZ (upper line): V<UTOBENNELONG<WOOLOOM<WAR<WA<<DINGO

c) One or more components truncated to a fixed number of characters:

Name: Dingo Potoroo Bennelong Wooloomooloo Warrandyte Warnambool
VIZ: BENNELONG WOOLOOMOOLOO WARRANDYTE WARNAMBOOL, DINGO POTOROO
MRZ (upper line): V<UTOBENN<WOOL<WARR<WARN<<DINGO<POTO

7.2.3.3 Names that just fit, indicating possible truncation by letter in the last position of the name field, but which are not truncated

Name: Stephen Trevor Papandropoulous
VIZ: PAPANDROPOULOUS, STEPHEN TREVOR
MRZ (upper line): V<UTOPAPANDROPOULOUS<<STEPHEN<TREVOR

Note.— Even though there is an alphabetic character in the 36th character position of this MRV-B upper machine readable line, this name has not been truncated but it shall be assumed that it has been truncated.

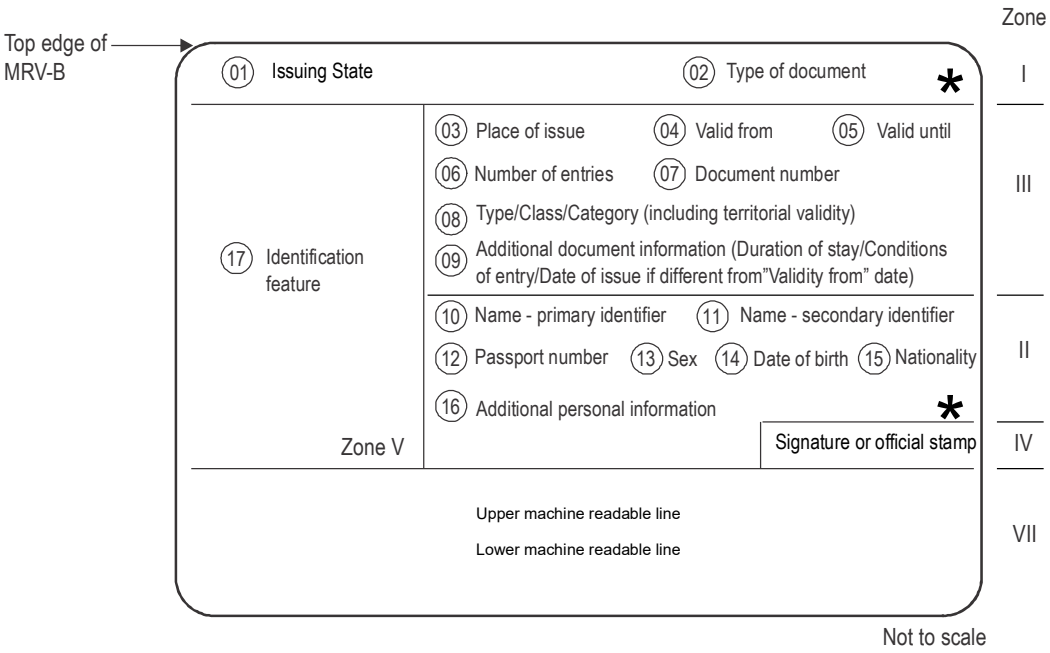
7.3 Portrait

Portrait. For the MRV Format-B the rectangular area defined in the data element directory as Zone V should contain a portrait. Such portrait, if included, shall represent only the holder of the MRV-B.

Portrait edges. The portrait may have irregular edges. When a digitally printed reproduction is used, the background of the portrait may be dropped out in order to provide protection against forgery or substitution.

Zone V without an identification feature. A standard default image, such as a national symbol, crest or wording, should be selected and used in Zone V when an identification feature is not included.

7.4 MRV-B Diagrams



* Optional control number – to be preprinted at the discretion of the issuing Sate either horizontally where shown in Zone I or in Zone II or vertically anywhere along the right-hand edge of Zone V (where present).

Figure 7. Location of data elements on an MRV-B.

Note 1.— VIZ based on maximum printing density of 8 lines per 25.4 mm (1.0 in) and horizontal printing density of 15 characters per 25.4 mm (1.0 in).

Note 2.— MRZ based on horizontal printing of 10 characters per 25.4 mm (1.0 in).

Note 3.— ◯ = field numbers.

Note 4.— The borderlines of the zones are not printed on the actual visa.

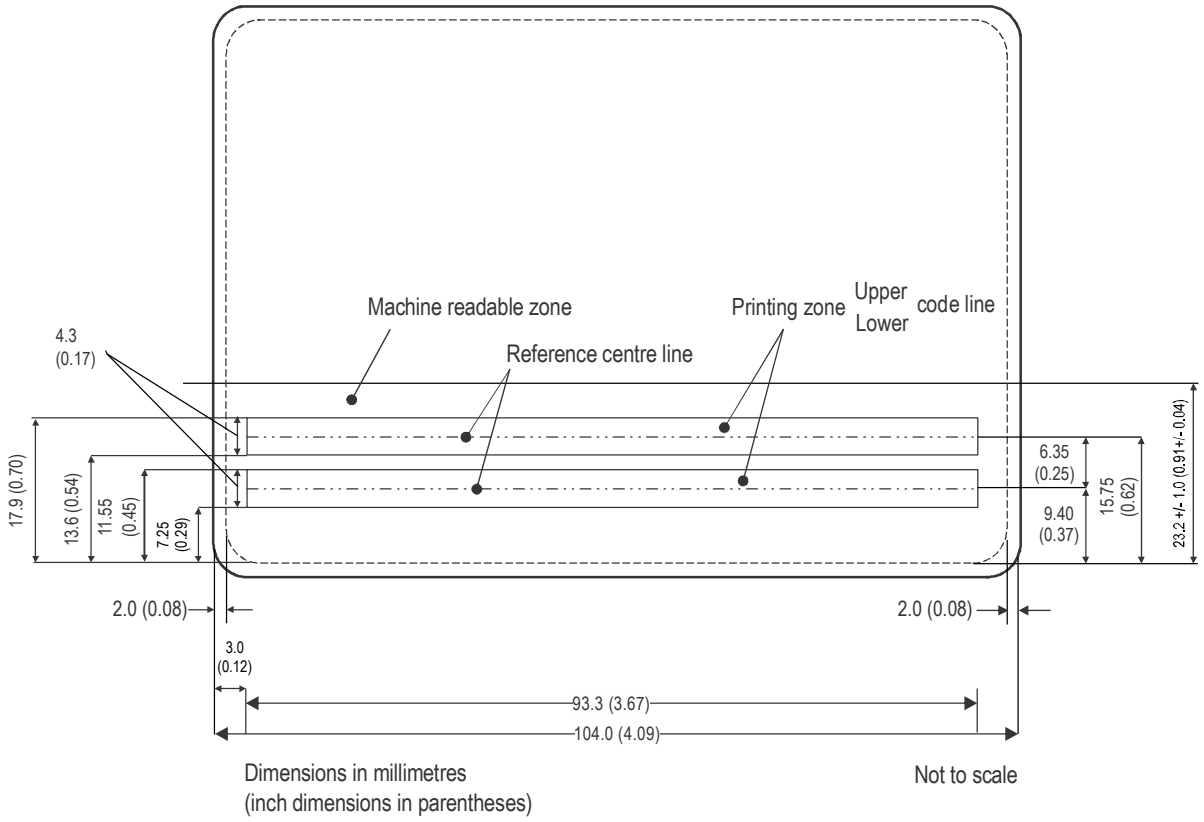


Figure 8. Schematic diagram of the Machine Readable Zone of an MRV-B.

Note.— For illustration purposes, the smallest option for the 105.0 mm (4.13 in) dimension of the MRV-B and the smallest option for the left-hand margin in the MRZ have been selected.

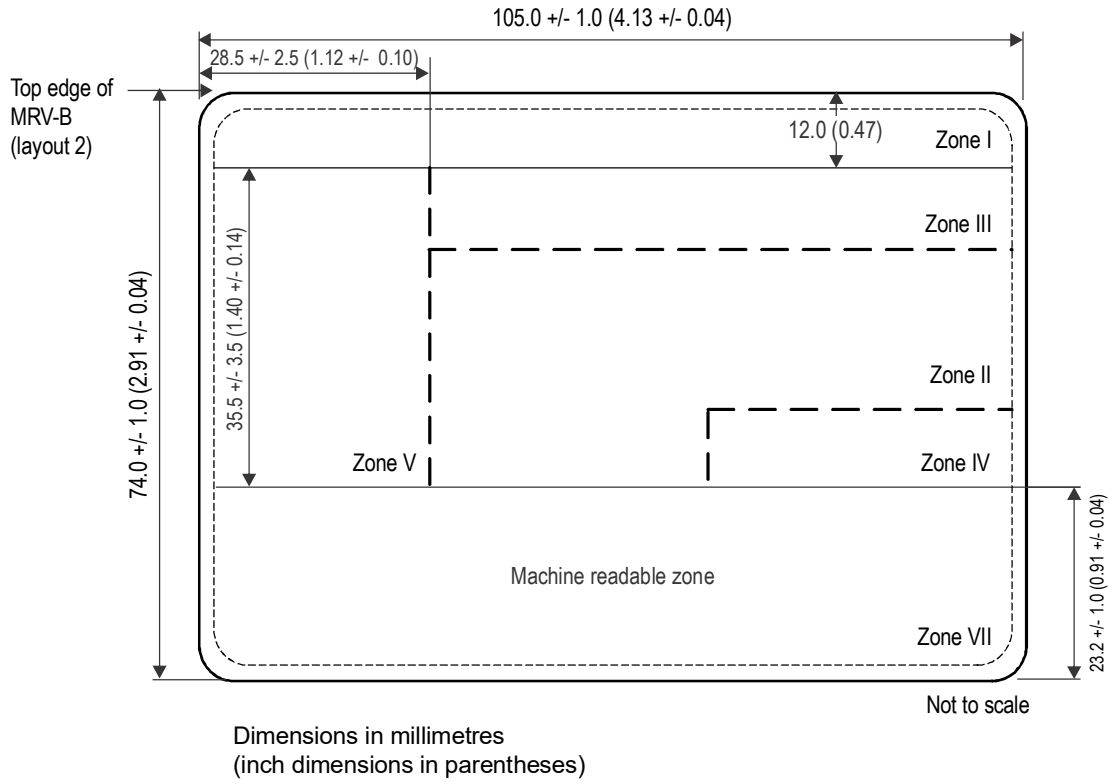


Figure 9. Nominal positioning of zones on an MRV-B.

This diagram should be considered in conjunction with Section 6.3. It assumes that all the available space for data in the Visual Inspection Zone is used. The line spacing in the VIZ is the closest permitted at 8 lines per 25.4 mm (1.0 in). If an issuing State requires less information the line spacing can be increased to print fewer lines in the VIZ.

Dotted lines indicate zone boundaries whose positions are not fixed, enabling issuing States flexibility in the presentation of data.

The dimensions of the identification feature (normally a portrait) shall be between a minimum of 32.0 mm × 26.0 mm (1.26 in × 1.02 in) and a maximum of 39.0 mm × 31.0 mm (1.54 in × 1.22 in). An issuing State may elect to issue an MRV in this format without an identification feature, replacing it with a crest or symbol.

Though the portrait position is defined as a rectangular area, it may have irregular edges or, if the portrait is digitally printed, have the background dropped out. Such technique may be used to provide protection against fraudulent alteration.

Affixed photographs (even if protected by a laminate) shall not be applied. Identification features shall be personalized.

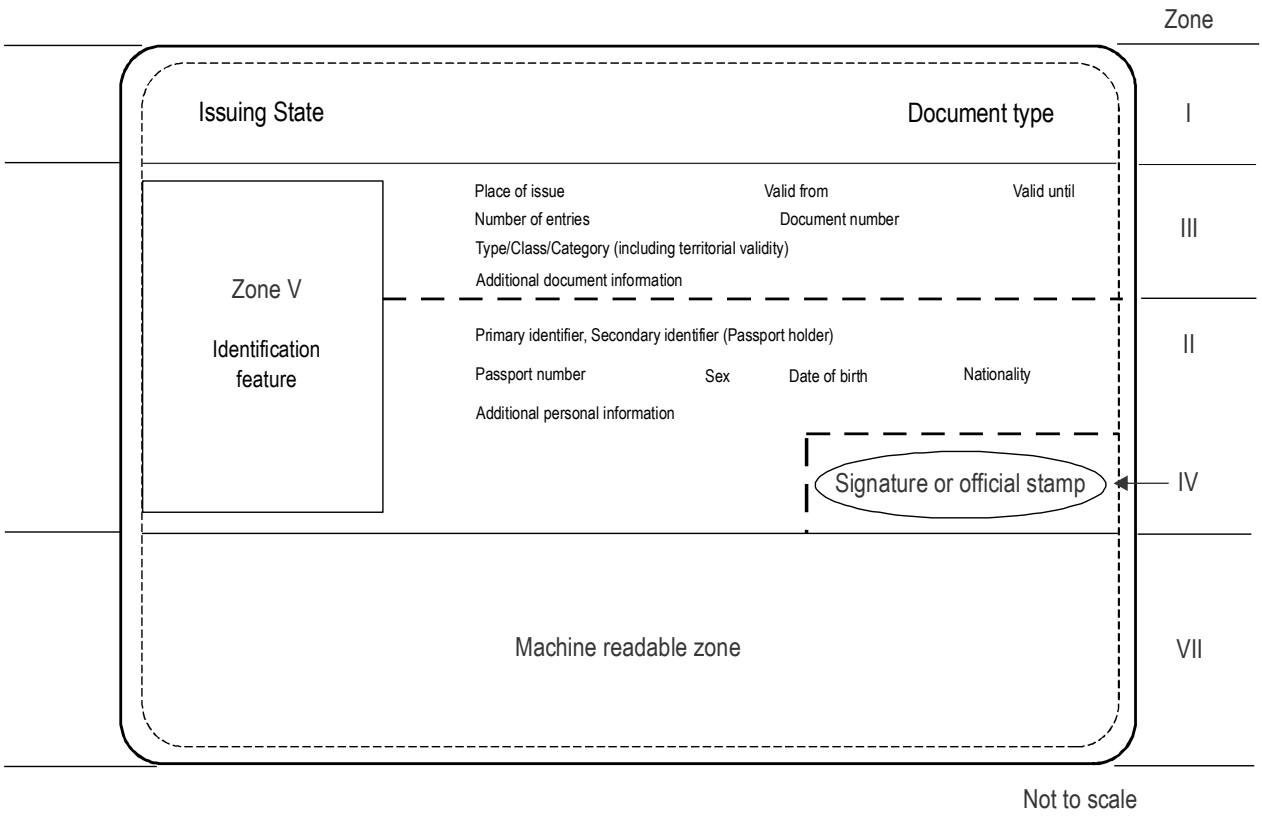


Figure 10. Data elements on an MRV-B.

Note 1.— Broken lines indicate zone borders whose position may be adjusted by the issuing State to optimize the presentation of the data. Solid lines indicate fixed zone borders. Zone border lines are not printed on the document.

Note 2.— Provided it is contained within the rectangular area, the identification feature may have irregular edges.

Note 3.— An issuing State may elect to issue a visa with the identification feature replaced by a crest or symbol.

8. USE OF OPTIONAL BARCODES ON MACHINE READABLE VISAS

8.1 Scope

This section defines the specifications governing the use of one or more bar codes on an MRV, at the discretion of the issuing State, to allow expansion of the machine readable data capacity.

8.2 Definition

A bar code is defined as a linear or two-dimensional bar code conforming with the specifications defined herein and capable of representing data therein and encoded data read therefrom.

8.3 Location of Bar Code(s)

Figures 11 and 12 illustrate the location of a bar code on the MRV-A and MRV-B, respectively, as well as the specifications for the exact placement and overall dimensions of the area to house any optional bar codes. It should be noted that the height and width of the bar code(s) area can vary up to the maximum dimensions shown. In defining these dimensions, the trade-off between optional expanded machine readable data capacity desired and accommodation of mandatory and optional details (VIZ) should be considered.

Figure 11. MRV-A with optional linear or two dimensional bar code

Figure 12. MRV-B with optional linear or two dimensional bar code

8.4 Quality of Bar Code(s)

The bar code(s) included in the bar code(s) area shall meet the overall symbol grade defined for the chosen symbology (symbologies) that allows symbols to be read, following final assembly of the MRV, most times in a single pass.

8.5 Symbologies and Logical Data Structure

In order to have the capability to support global data interchange with authorized bodies such as airlines, the bar code symbology selected must offer sufficient data storage capacity to accommodate all mandatory data elements included in the mandatory data groups and in any optional data groups which may be selected from the logical data structure as developed for optional capacity expansion technologies. Furthermore, the associated reading software must be available in the public domain.

8.6 Machine Reading of the Bar Code(s)

To enable accurate reading of bar code(s) coexisting with security treatments (e.g. background security printing) in the bar code(s) area, and the use of a single machine reader for reading the MRZ and the bar code(s), where desired by a State, the bar code(s) optionally included on the MRV shall be printed such that the bar code(s) absorb(s) in the B900 band as defined in ISO 1831 (i.e. near infra-red). The bar code(s) may be visually legible.

In determining the placement of the bar code on the MRV, issuing States shall accommodate any special needs or operating conditions of the symbology (symbologies) such as bit area and error correction level. In addition, sufficient marginal space shall be included to accommodate “quiet areas”.

Issuing States are encouraged to locate the bar code(s) area nearest to the top edge of the MRZ to allow for possible use of the optical sensing components from the OCR reader, supported by bar code interpretation logic, to accommodate reading of optional bar code data.

The bar code(s) optionally included in the bar code(s) area of the MRV shall not interfere with the accurate reading of data from the MRZ.

9. USE OF OPTIONAL DIGITAL SEALS FOR VISA DOCUMENTS

Doc 9303-13 specifies visible digital seals (VDS) for non-electronic documents. In this section the specific rules and requirements for the use of visible digital seals on Visa documents are described.

9.1 Content and Encoding Rules

9.1.1 Header

The Document Feature Definition Reference for this use case is `93dec`. The Document Type Category for visas is 0 x 01. Otherwise, the content of the header is the same as defined in Doc 9303-13, Section 3.1.1.

9.1.2 Document Features of a VDS for Visas

The following document features are stored in the seal:

Machine Readable Zone (REQUIRED)

The Machine Readable Zone (MRZ) of a visa contains the following information:

- issuing state
- primary and secondary identifiers
- passport or visa number
- nationality of the document holder
- date of birth of the document holder
- sex of the document holder
- validity period (valid until…)

Some States may not issue paper-based visas, but instead use a domestic database to store visa applications, and merely attach a confirmation sticker to the passport. If such States choose to adopt this standard for such stickers, the above information SHALL be encoded as either the MRZ of an MRV-A or MRV-B.

Additionally, the following document features are stored:

Number of Entries (OPTIONAL)

The number of times the visa holder may enter the territory for which the visa is valid.

Duration of Stay (REQUIRED)

This feature denotes the number of days, months or years during which the visa holder may stay in the territory for which the visa is valid. Note that this is distinct from the “valid until” date of the MRZ, which is already stored in the visa MRZ. First, in most cases, this “valid until” field of the visa MRZ will be the date of expiry of the MRV and indicates the last day on which the visa can be used to seek entry. For some States, this will be the date by or on which the holder should have left. Second, for some issuing States, the stay must be continuous, and for others, the stay can spread over several periods. Thus, to avoid ambiguity during validation, the feature for the duration of stay is required.

Passport Number (REQUIRED)

This feature denotes the number of the passport to which the visa sticker is attached. The passport number might already be present in the MRZ. At the discretion of the issuing State, either the passport number or the visa number SHALL be used in the document number field of the visa MRZ; however, the latter option can only be exercised where the visa number has nine characters or fewer. To avoid ambiguity during validation, the field for the passport number (separate from the MRZ) is required.

Visa Type (OPTIONAL)

This feature encodes the type of the visa. The field is especially intended to be used, if the type of the visa is not encoded as the second letter of the MRZ.

Additional Feature Field (OPTIONAL)

Reserved for future use. This field is OPTIONAL, and intended to store additional verification information in future versions of this standard.

9.1.3 Encoding Rules for Document Features

In the following, the digital encoding of document features of the visa seal is defined.

MRZ of MRV-A (see Section 4.2.2)

Tag: 0 x 01
Min. Length: 48 Byte
Max. Length: 48 Byte Value Type: Alphanumeric
Required: Required (if visa is of type MRV-A)
Content: The first line of the MRZ of an MRV-A (44 characters) and the first 28 characters of the second line of the MRZ of an MVR-A, concatenated and encoded by C40. The filler symbol < in the MRZ is replaced by <SPACE> prior to encoding by C40.

MRZ of MRV-B (see Section 7.2.2)

Tag: 0 x 02
Min. Length: 44 Byte
Max. Length: 44 Byte Value Type: Alphanumeric
Required: Required (if visa is of type MRV-B)
Content: The first line of the MRZ of an MRV-B (36 characters) and the first 28 characters of the
second line of the MRZ of an MVR-B, concatenated and encoded by C40. The filler symbol < in the MRZ is replaced by <SPACE> prior to encoding by C40.

Number of Entries

Tag: 0 x 03
Min. Length: 1 Byte
Max. Length: 1 Byte Value Type: Integer
Required: Optional
Content: The integer in the range of `0-255dec` encodes the number of allowed entries. A value of 0 denotes unlimited entries.

Duration of Stay

Tag: 0 x 04
Min. Length: 3 Byte
Max. Length: 3 Byte Value Type: Integer
Required: Mandatory
Content: The duration of stay is encoded as specified in Table 1.

Table 1. Encoding for the Duration of Stay

Integer Values of			*Meaning*
Byte 1	*Byte 2*	*Byte 3*	
0	0	0	The “valid until” field of the MRZ denotes the last day on which the visa holder may stay in the country for which the visa was issued.
255	255	255	The “valid until” field of the MRZ denotes the last day on which the visa holder may seek entry at the border for which the visa was issued. The duration of stay is determined by the authorities at the time of entry at the border.
number of days	number of month	number of years	The duration of stay is the sum of the number of days, the number of months, and the number of years, calculated from the time on which the visa holder enters the country for which the visa was issued. The “valid until” field of the MRZ denotes the last day on which the visa-holder may seek entry. The triples (0, 0, 0) and (255, 255, 255), are reserved and, as seen above, MUST NOT be used in this case.

Passport Number

Tag: 0 x 05
Min. Length: 6 Byte
Max. Length: 6 Byte Value Type: Alphanumeric
Required: Mandatory
Content: The passport number of the passport of the applicant on which the visa sticker is attached.

Visa Type

Tag: 0 x 06
Min. Length: 1 Byte
Max. Length: 4 Byte Value Type: Binary
Required: Optional
Content: The visa type is encoded as a binary sequence.

Additional Feature

Tag: 0 x 07
Min. Length: 0 Byte
Max. Length: 254 Byte Value Type: Binary
Required: Optional
Content: Reserved for future use.

9.2 Visa Signer and Seal Creation

With respect to this visa profile, Visa Signer Certificates (VSCs) are issued in a way that allows verification by Country Signing Certificate Authority (CSCA) certificates. A possible architecture and implementation for the Visa Signer and its client is described in Doc 9303-13, Section 3.2.1. For the security of the visa signing system, see Doc 9303-13, Section 3.2.2

9.3 Public Key Infrastructure (PKI) and Certificate Profiles

In general, the requirements from Doc 9303-12 apply. The following deviations apply due to the specific characteristics and properties of visa documents.

Visa specific validity periods are as follows:
Private Key Usage Time for VSCs: 1 to 2 years

9.4 Validation Policy Rules (Informative)

For the validation policy of digital seals on visas, all rules from Doc 9303-13, Appendix D are valid. In addition, the following rules to determine the validity of the digital seal apply.

In addition to the generic Document Validation Policy, the policy for visas considers the following questions:

1. Is the MRZ of the passport valid?
2. Does the MRZ of the passport match with the MRZ of the visa?

Additional visa-specific validation rules for each type of control are given below. In addition, validation criteria, expected results for each criteria, and resulting status sub-indications are listed. See Table 2.

Visible Digital Seal Validation

1. Visa MRZ Validation
   - if the checksums of the visa MRZ are not compliant with the applicable norm, depending on the visa type, then the status is INVALID with sub-indication INVALID_VISA_MRZ,

- if there is a mismatch between a field of the visa MRZ and the corresponding document feature stored within the seal, then the status is INVALID with sub-indication SEAL_VISA_MISMATCH. Additional information on the mismatch SHOULD be provided. Otherwise, the visa MRZ validation should continue.

2. Passport MRZ Validation
   - If the checksums of the passport MRZ are not compliant with the applicable norm, depending on the passport type, then the status is INVALID with sub-indication INVALID_PASSPORT_MRZ. Otherwise, the passport MRZ validation should continue.

3. Passport Link Validation
   - If any of the fields of the passport MRZ listed as follows do not correspond to their equivalent feature stored in the digital seal, then the status is INVALID with sub- indication SEAL_PASSPORT_MISMATCH. The MRZ fields of the passport are: 1) passport number and 2) passport issuing State. Otherwise, if all fields match, the status of the Visible Digital Seal is VALID.

The generic and visa-specific validation rules cover a comparison of the data stored in the seal against data stored on the MRZ of the visa and the passport. Furthermore, a manual inspection of those data that are stored in the seal and printed on the visa, but are not present in the MRZ of the visas, could be conducted.

Table 2. Recommended Trust Levels of the Visa Policy for Visa specific sub-status indications

Status indication	*Sub-status indication*	*Trust level*
INVALID	INVALID_VISA_MRZ	*High fraud potential*
	SEAL_VISA_MISMATCH	
	INVALID_PASSPORT_MRZ	
	SEAL_PASSPORT_MISMATCH	

10. REFERENCES (NORMATIVE)

Certain provisions of the following international Standards, referenced in this text, constitute provisions of Part 7 of Doc 9303. Where differences exist between the specifications contained in Part 7 and the referenced Standards, to accommodate specific construction requirements for machine readable travel documents, including machine readable visas, the specifications contained herein shall prevail.

ISO/IEC 7810	ISO/IEC 7810:2019, Identification cards — Physical characteristics
ISO 1831	ISO 1831:1980, Printing specifications for optical character recognition

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Appendix A to Part 7

EXAMPLES OF PERSONALIZED MRVs (INFORMATIVE)

A.1 MRV-A EXAMPLES

UTOPIA **VISA**

Place of Issue/*Lieu de délivrance*: ZENITH

Valid from/*Valide à partir du*: 10 DEC/DÉC 91

Valid until/*Valide jusqu'au*: 10 DEC/DÉC 96

No. of Entries/*Nombre d'entrées*: MULTIPLE

Document No./*N° de document*: M123889546

Type/*Type*: BUSINESS MULTIPLE

Surname, Given names/*Nom, Prénoms*: ERIKSSON ANNA MARIA

Passport Number/*N° de passeport*: L8988901C

Sex/*Sexe*: F/F

Date of Birth/*Date de naissance*: 12 AUG/AOÛT 74

Nationality/*Nationalité*: XXX

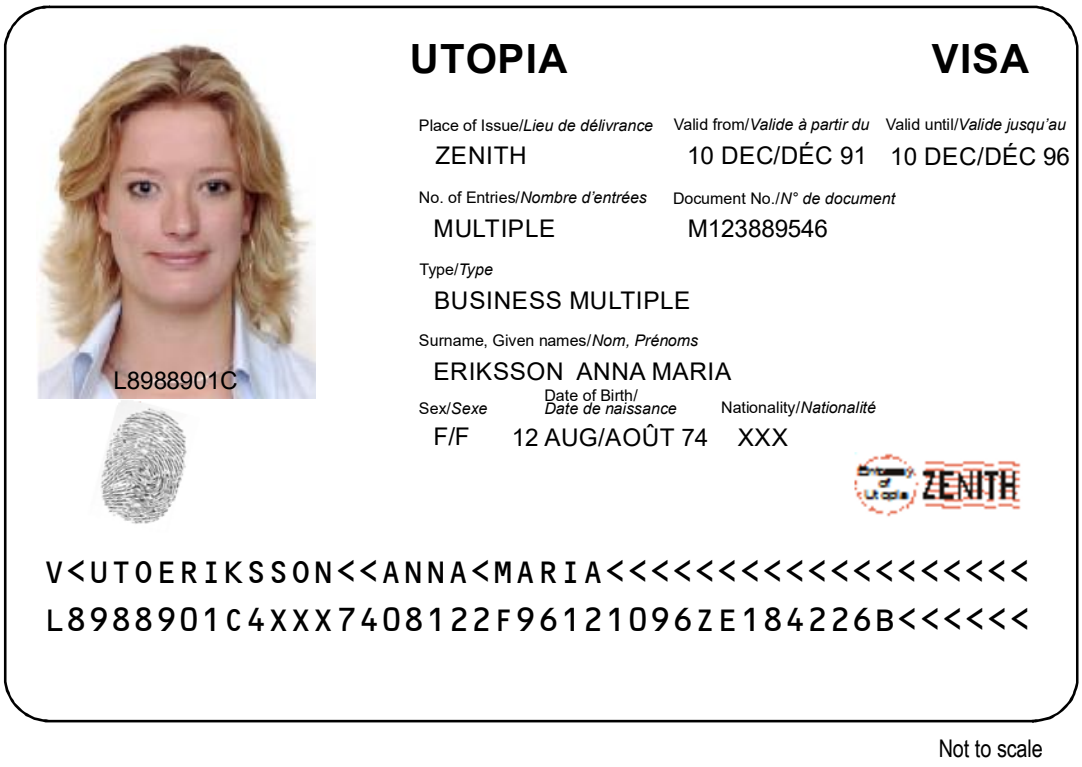
Signature of Issuing Officer: John Doe

V<UTOERIKSSON<<ANNA<MARIA<<<<<<<<<<<<<<<<<<<<

L8988901C4XXX7408122F96121096ZE184226B<<<<<<

Not to scale

Figure A-1. Example illustrates an MRV-A with: Zones I, III, II, IV, V and VII; a holder with unspecified nationality (i.e. "XXX").



Not to scale

Figure A-2. Example illustrates the same MRV-A as in Figure A-1 but with: Zone V increased in size to accommodate fingerprint and thus overlaying part of Zone I; part of Zone II (passport number) overlaying Zone V; and an issuing office stamp instead of the signature in Zone IV.

A.2 MRV-B EXAMPLES

Figure A-3. Example illustrates an MRV-B with: Zones I, III, II, IV, V and VII; a holder with unspecified nationality (i.e. "XXX").

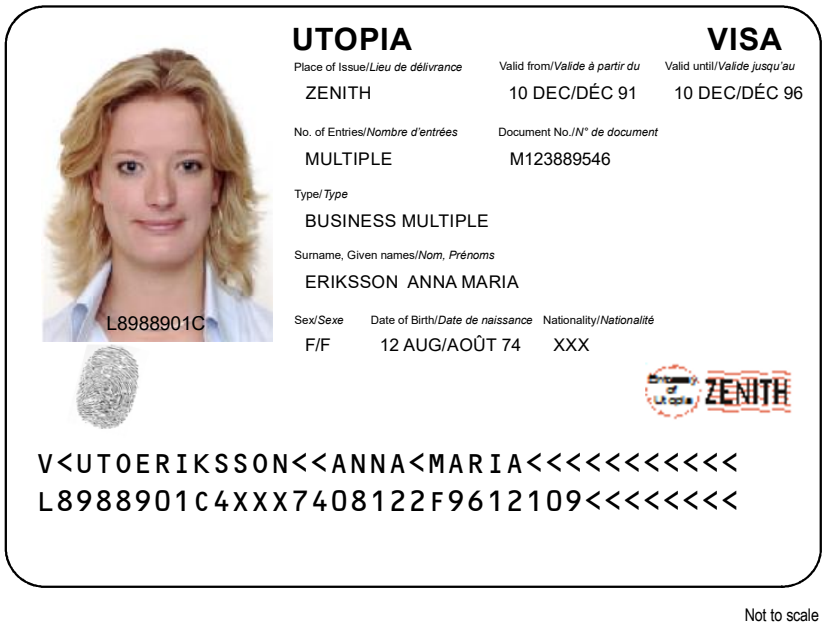


Figure A-4. Example illustrates the same MRV-B as in Figure A-3 but with: Zone V increased in size to accommodate fingerprint and thus overlaying part of Zone I; part of Zone II (passport number) overlaying Zone V; and an issuing office stamp instead of the signature in Zone IV.

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Appendix B to Part 7

CONSTRUCTION OF THE MRZ (INFORMATIVE)

B.1 MRV-A MRZ CONSTRUCTION

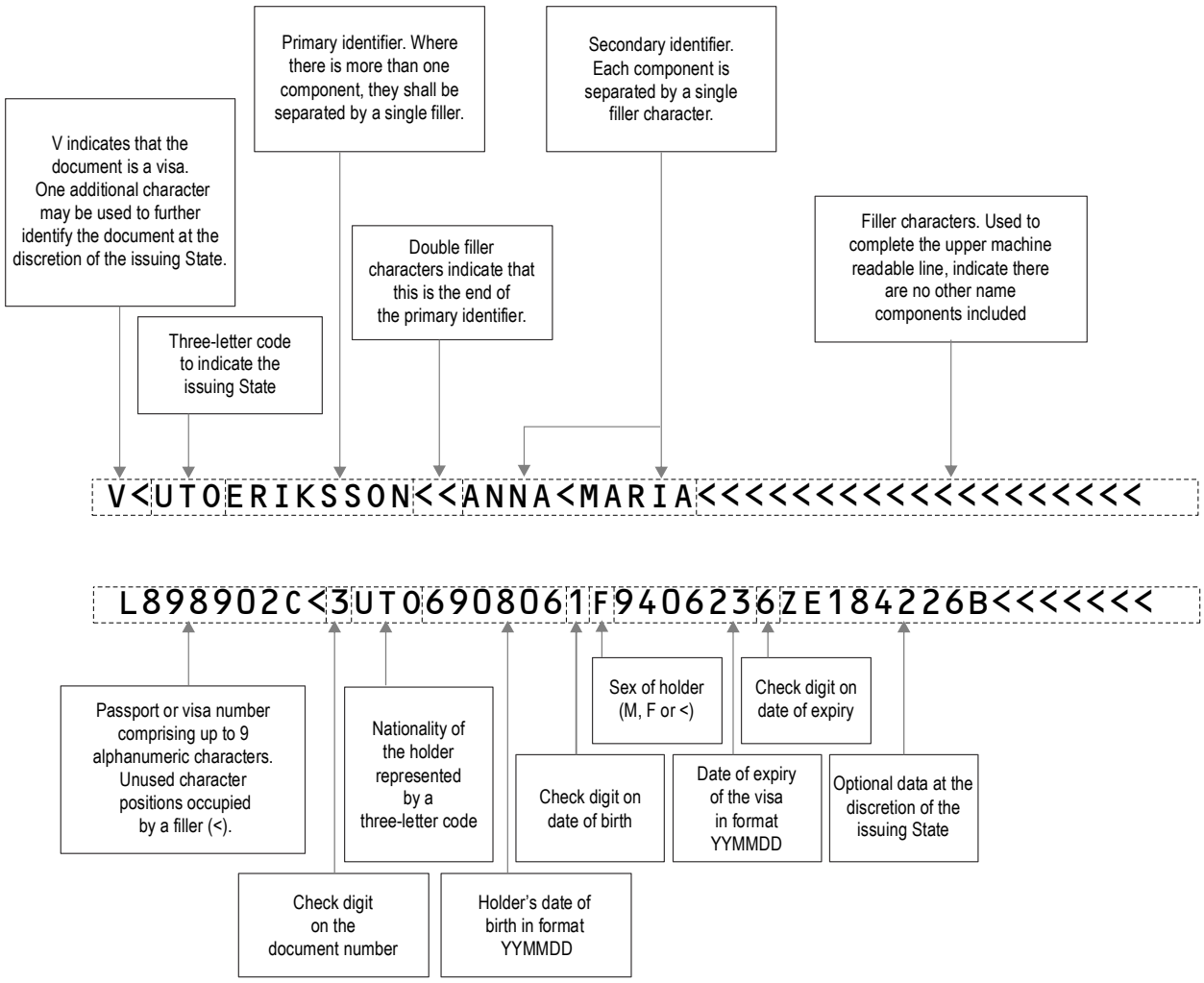

Figure B-1. MRV-A MRZ construction.

Note 1.— Three-letter codes are given in Doc 9303-3.

Note 2.— Dotted lines indicate data fields; these, together with arrows and comment boxes, are shown for the reader's understanding only and are not printed on the document.

Note 3.— Data are inserted into a field beginning at the first character position starting from the left. Any unused character positions shall be occupied by filler characters (<).

B.2 MRV-B MRZ CONSTRUCTION

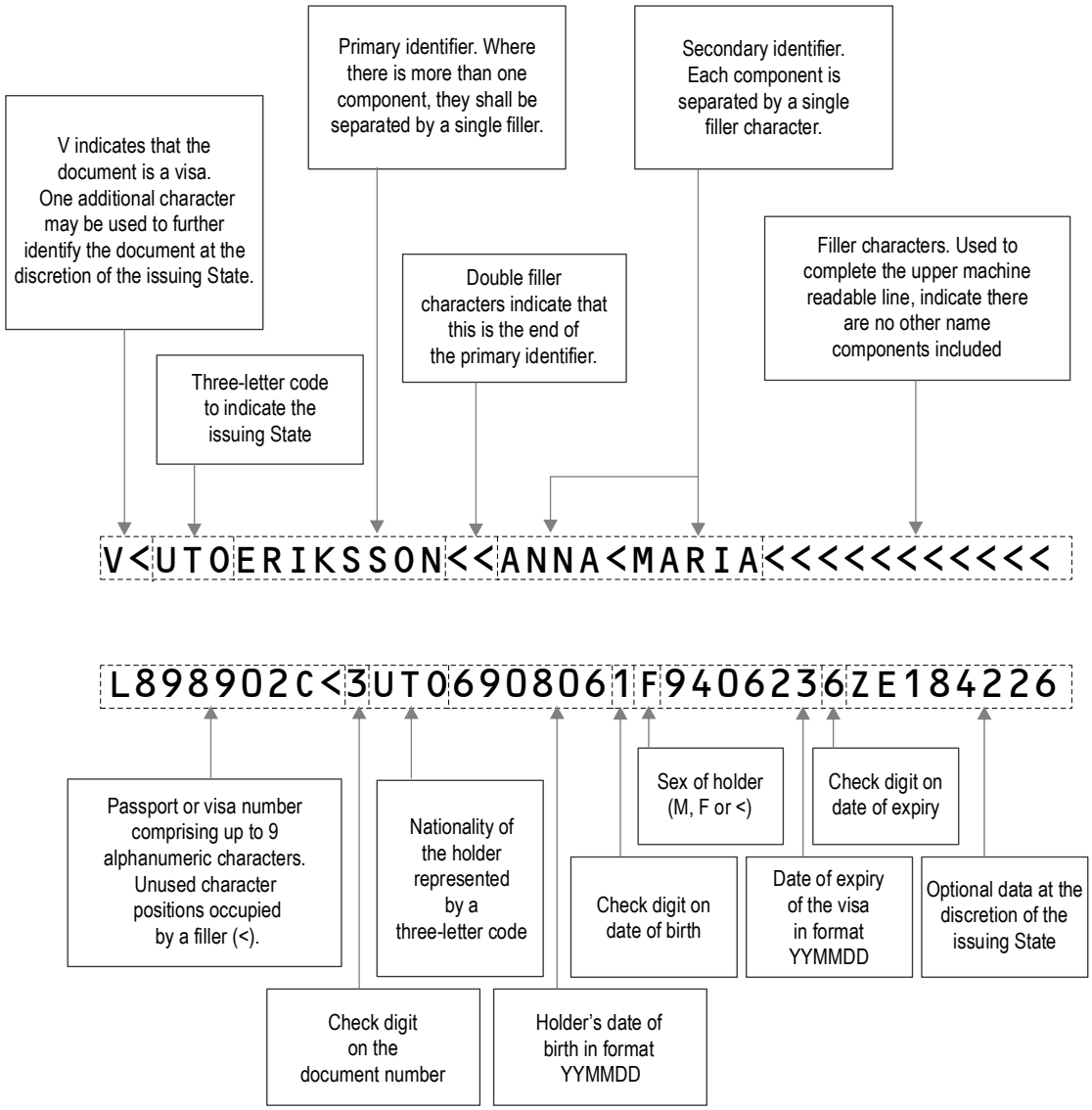

Figure B-2. MRV-B MRZ construction

Note 1.— Three-letter codes are given in Doc 9303-3.

Note 2.— Dotted lines indicate data fields; these, together with arrows and comment boxes, are shown for the reader's understanding only and are not printed on the document.

Note 3.— Data are inserted into a field beginning at the first character position starting from the left. Any unused character positions shall be occupied by filler characters (<).

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Appendix C to Part 7

POSITIONING IN PASSPORT (INFORMATIVE)

C.1 MRV-A POSITIONING

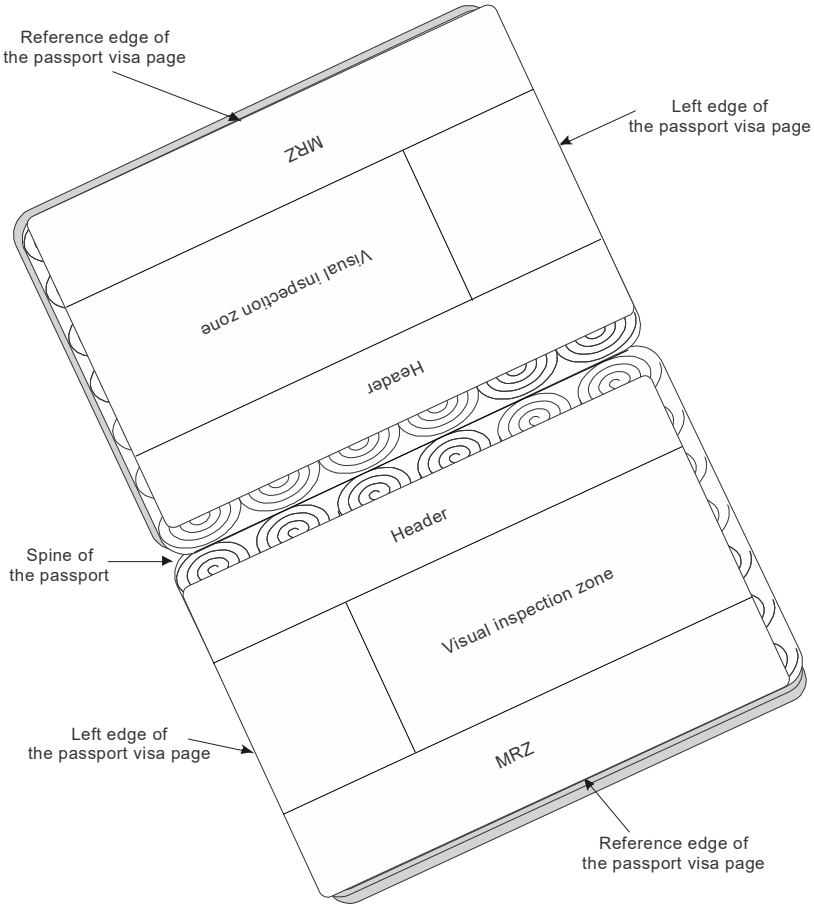


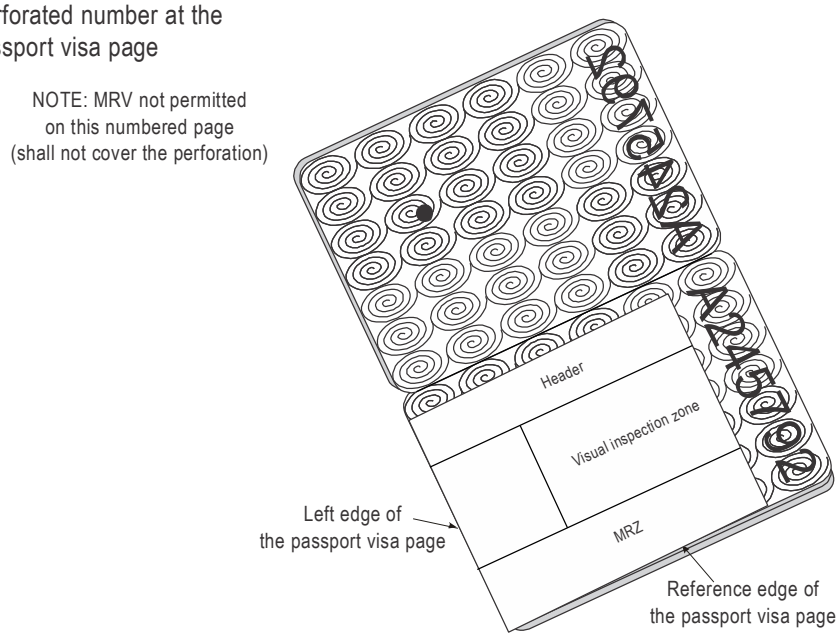
Figure C-1. MRV-A Positioning

Each MRV shall be placed so that:

- the two OCR lines of the MRZ are parallel to the appropriate reference edge of the passport visa page;
- the leading characters of each OCR line are positioned with respect to the left edge of the passport visa page;
- the MRZ is immediately adjacent to the appropriate reference edge of the passport visa page; and
- no MRV may be placed on top of another, nor on the reverse of a page that already has an MRV affixed, nor on the reverse of an MRP data page.

C.2 MRV-B POSITIONING

Example 1:
Printed or perforated number at the top of the passport visa page



Example 2:
Printed or perforated number at the bottom of the passport visa page

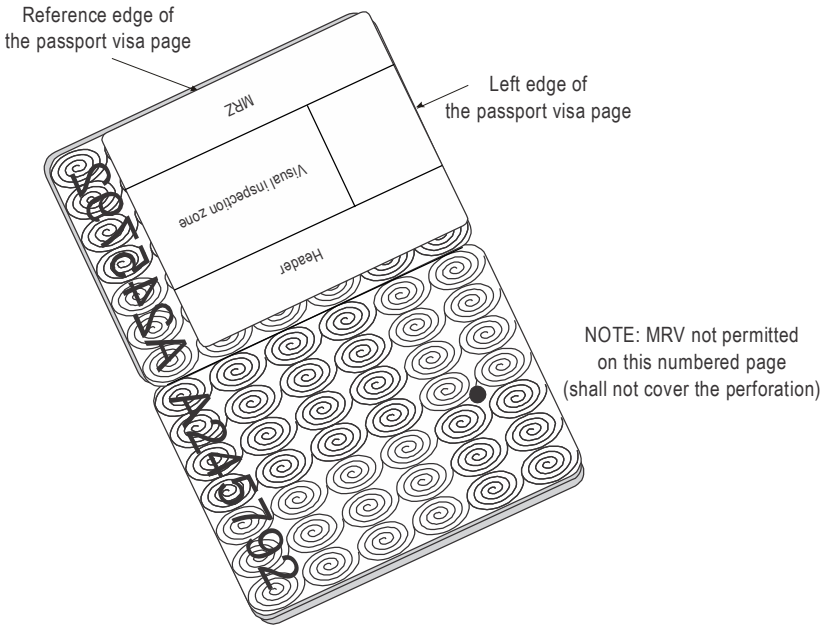


Figure C-2. MRV-B Positioning

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Appendix D to Part 7

MATERIALS AND PRODUCTION METHODS (INFORMATIVE)

Note 1.— The following information reflects some past as well as current practices of MRV producers and is included here for guidance only. It is not an endorsement of any product or method.

Note 2.— It is the responsibility of the issuing State to ensure that the MRV selected for issue is constructed in such a way that the document will perform satisfactorily for its required life.

Traditionally, visas have taken the form either of a label affixed to a page of the holder's passport or the application of an imprint onto the passport page usually with manual infilling for the personalization. Manual infilling is obviously impractical for machine readable visas where very precise characters for optical recognition are required. There is no fundamental reason why a visa should not be imprinted onto a passport page using a printer capable of printing OCR-B. However, an issuing State that elects to do this will find that many passports, which, of course, are issued by other States, have printed or perforated numbers or other printing on their pages which can absorb the infra-red light used by the document reader and result in a failure to read at border control. In general, therefore, it is better to use a machine readable visa in the form of a label affixed to the passport page.

An MRV can have a life limited to a single entry into a country or it can allow multiple entries over the life of the passport or beyond. The issuing State should ensure that the MRV is appropriately durable for the required life. States should also ensure that their visas are resistant to fraud. States can achieve considerable protection against these threats where border control has access to a central database containing the details of the issuance of genuine visas. However this is not always practicable. The threats are:

- total counterfeiting of the document;
- removal of a visa from one passport and its placement in another;
- alteration of the personal information or validity data.

Substrate. Visas have been produced using either paper or a synthetic polymer as the substrate. The substrate should have adequate opacity to prevent any printing or perforations on the passport page affecting the machine reading. The substrate should exhibit no visible fluorescence when irradiated by ultra violet light. Common choices of security features for paper have included: chemical reactants, iridescent plaquettes, fibres (silk and/or synthetics, visible and/or invisible, fluorescent and/or non-fluorescent), and security threads. Synthetic polymer substrates may also incorporate some of these security features. Care must be taken to ensure that any chemical reactants used are unaffected by the adhesive used to affix the visa. It is desirable that the substrate be damaged by attempts to alter the data on the visa or to remove it from the passport. The damage may take the form of tearing or distortion.

Inks. Inks that are chemically fugitive, fluorescent, heat sensitive, and optically variable are means of enhancing security in the MRV.

Printing. Fine line printing, rainbow (split fountain) printing using guilloche patterns, intaglio printing, and incorporation of concealed images into the design are methods of enhancing both the security and aesthetics of the MRV.

Adhesive. Water-moistenable or pressure-sensitive adhesives have been used to affix visas into passports. The selected adhesive should achieve and maintain a strong bond even when heated. The adhesive/substrate combination should be such that the substrate tears or distorts before the adhesive bond fails.

Die cutting. Though the final size and shape of the visa is defined in these specifications, the size is too small for most types of visa infilling printers. It is therefore normal for an issuing State to procure visas in a sheet form suitable for the infilling printer with one or more visas contained within the sheet area, the visas being die cut to shape. It is important to ensure compatibility between the sheets of visas and the printer to ensure that the visas do not become separated from the carrier sheet in the printer. It is also important to ensure that the edges of the sheet or of the die-cut shape are not contaminated with adhesive which can build up in the printer and result in misfeeding. Consistency of position of the die-cut shape relative to the edges of the sheet is important to ensure that the machine readable information is placed within the ERZ.

Personalization. Most forms of variable image printing, including laser (covered by a laminate), ink jet, dye sublimation and dot matrix printing have been used in the personalization of visas, with the first three used where a portrait is required. To minimize the risk of fraudulent removal of the personalization, the selected combination of substrate and infilling method should achieve a high penetration of the image into the substrate or a strong bond between the material forming the image and the substrate.

Protecting the personalization. Protective laminate or lacquer layers may be used to secure the data on the visa. Any laminate material should be firmly bonded to the substrate so that disruption of the substrate or destruction of the laminate material occurs when attempts are made to remove the laminate.

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Appendix E to Part 7

WORKED EXAMPLE VISIBLE DIGITAL SEAL FOR VISA DOCUMENT (INFORMATIVE)

The following example shows a Visible Digital Seal that results from encoding the data shown in Figure E-1. To generate the signature, ECDSA-256 with the curve brainpoolP256r1 was used. The domain parameters of brainpoolP256r1 and the private key encoded as Base64 are:

```
-----BEGIN EC PARAMETERS-----
MIHgAgEBMCwGByqGSM49AQECIQCp+1fboe6pvD5mCpCdg41ybjv2I9UmICggE0gd
H25TdzBEBCB9Wgl1/CwwV+72dTBBev/n+4BVwSbcXGzpSktE8zC12QQgJtxcbOlK
S0TzMLXZu9d8v5WEFilc9+HOa8zcGP+MB7YEQQSL0q65y35XyyxLSC/8gbevud4n
4eO9I8I6RFO9ms4yYlR++DXD2sT9l/hGGhRhHcnCd0UTLe2OVFwdVMcvBGmXAiEA
qftX26Huqbw+ZgqQnYONcYw5eqO1Yab3kB4OgpdIVqcCAQE=
-----END EC PARAMETERS-----
-----BEGIN EC PRIVATE KEY-----
MIGVAgEAMBQGByqGSM49AgEGCSskAwMCCAEBBwR6MHgCAQEEIFurNtlcXTT/OweZ
OPEd4F5QO8v1kn56es1O/XTSSRtDoAsGCSskAwMCCAEBB6FEA0IABAgTKnJDs8zC
nCcQlwgclqcp7vuOuTYw5TZJjpt84c7SXWinidk77znARxXFrTkV0oHAdU7MCFCL
9maH78Yw34g===
-----END EC PRIVATE KEY-----
```

Encoding input data yields a byte stream, which are both depicted in the image below. Hashing the header and message with SHA-256 and signing them with the above private key gave the following signature (r,s):

```
r:
21C6785B027EC4A5BFA6DDE537E8ADFA91BEB1197BED97ADF2FF89E0A344512B
s:
7B0136C44050F117E507BC2A782FFE15F68DDD6818AF5A7BAF21CA7CFC7E83BE
```

For the sake of completeness, the signature as DER encoded ASN.1:

```
3044022021C6785B027EC4A5BFA6DDE537E8ADFA91BEB1197BED97ADF2
FF89E0A344512B02207B0136C44050F117E507BC2A782FFE15F68DDD68
18AF5A7BAF21CA7CFC7E83BE
```

Header

Issuing Country

UTO

Three-letter country code

Document Issue Date

13.06.2020

Signing Certificate

UTTS5b (Utopia)

Select seal type

Visa Document

Visa Document

MRZ 1st line

VCD<<DENT<<ARTHUR<PHILIP<<<<<<<<<<

MRZ 2nd line

1234567XY7GBR5203116M2105253<<<<<<<<

Passport Number

ABC424242

Duration of Stay

5a0000

Format ddmmyy encoded as hex string.

Number of Entries

2

Visa Type

The visa type is encoded as hex string.

Additional Feature

Reserved for future use. Encoded as hex string.

Status

Everything worked like a charm.

SignerCertRef

UTTS025B

Encoded RAW data

```
DC 03 D9 C5 D9 CA C8 A7 3A 99 5D 91 34 5D DF 54
5D 01 02 2C DD 52 13 4A 74 DA 13 47 C6 FE D9 5C
B8 9F 9F CE 13 3C 13 3C 13 3C 13 3C 20 38 33 73
4A AF 47 F0 C3 2F 1A 1E 20 EB 26 4D 39 3A FE 34
04 03 5A 00 00 05 06 59 E9 32 F9 26 C7 03 01 02
FF 40 21 C6 78 5B 02 7E C4 A5 BF A6 DD E5 37 E8
AD FA 91 BE B1 19 7B ED 97 AD F2 FF 89 E0 A3 44
51 2B 7B 01 36 C4 40 50 F1 17 E5 07 BC 2A 78 2F
FE 15 F6 8D DD 68 18 AF 5A 7B AF 21 CA 7C FC 7E
B3 BE
```

Figure E-1. Example Visible Digital Seal for Visa

Suppose that `seal.bin` contains the header and message zone (note that start and length of the signature zone 0xFF and 0x40 are excluded), that the signature is DER encoded in `sig.bin`, and the above PEM encoded private key in `priv_key.pem`. The signature can then be verified with `openssl` by:

```
openssl dgst -sha256 -prverify priv_key.pem -signature sig.bin
- sha256 seal.bin
```

— END —

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