A PASSPORT WITH MACHINE READABLE CAPABILITY



Note.— The machine readable passport described herein may either be issued as a separate document or be included in a booklet for endorsements.

FOREWORD

This document contains recommended specifications for a passport with machine readable capability which was developed by a Panel of Experts reporting to ICAO. The purpose of the passport is to accelerate the movement of international passengers through passport clearance controls at airports.

Recognizing the advantages to be gained from the use of standardized documentation of this type, the findings of the Panel of Experts are circulated for the guidance of States.

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INTRODUCTION

Initial Action by the Facilitation Division of ICAO

1. At its Seventh Session, held in Montreal in May 1968, the Facilitation Division was concerned with the implications of ever-increasing volumes of passenger traffic, particularly in the light of the impending introduction on many international routes of high-capacity aircraft. The Division recognized that new ways and means had to be found in order to process such growing passenger volumes through governmental clearance controls at a faster pace and thus keep delays on the ground to a minimum. One proposal put forward concerned the possible development and introduction of a machine readable Passport or Passport Card, which might eventually replace the conventional passport and which could be expected to accelerate individual clearance through passport controls, either by using it as an electronically readable document or, where the volume of traffic did not warrant the installation of electronic data processing equipment, by permitting faster visual inspection than would be possible with a conventional passport. The Division therefore recommended (Rec. No. B-2) the establishment of a small Panel of suitably qualified experts to study this matter.

Action by the Air Transport Committee and Council of ICAO

2. The Council subsequently approved this Recommendation and the Panel's terms of reference were as follows:

"To study and make recommendations to the Air Transport Committee on the following:

a) the establishment of an appropriate document such as a passport card, a normal passport or an identity document with electronically or mechanically readable (as well as visually readable) inscriptions that meet the requirements for document control;
b) to determine the best types of procedures, systems (electronic or mechanical) and types of equipment for use with the above documents that are within the resources and capability of Member States;
c) determine the feasibility of standardizing the requisite control information and methods of providing this information through automated processes, provided that these processes will meet the requirements of security, speed of handling and economy of operation. . . ."

3. The Panel on Passport Cards was established in November 1968 comprising Members from eight Contracting States (Australia, Canada, France, Federal Republic of Germany, India, Kenya, Sweden and the United States). Subsequently, the Air Transport Committee approved nominations received from two additional States (the United Kingdom and the USSR). The International Criminal Police Organization and the International Air Transport Association were invited to participate as Observers. The Panel held five meetings between 1969 and 1978 (the Fifth Meeting being joined also by Observers from Belgium and the Kingdom of the Netherlands) and concluded with the adoption of five Recommendations concerning the production and use of the machine readable Passport. Certain difficulties which arose in technical research for solutions to some specifications laid down in the Panel's Fourth Report, had prevented the Panel from concluding its work earlier.

Action on the Panel's Report

4. The Air Transport Committee of ICAO, in April 1980, completed its consideration of the Panel's Report of its Fifth Meeting, assisted by further observations obtained from Contracting States and Panel Members. The Committee agreed in principle with the content of the Report and the publication of an ICAO document, based upon the material contained in Part III of that Report, with certain amendments, for the guidance of Contracting States.

GENERAL

Aims

5. The use of a machine readable passport (MRP) to replace the conventional passport is a means of accelerating the clearance of an increasing number of passengers at international airports. Since, however, the laws and regulations of States relating to travel documents usually apply uniformly whatever mode of transport is used, the MRP must also be suitable for use at surface transport border crossing points. Furthermore, it needs to offer safeguards equal to, or better than, those of conventional passports and to satisfy those control requirements already met by conventional passports (and other travel documents) currently in use throughout the world.

6. This latter requirement is essential since a certain number of States may not wish, or be in a position, to issue the new document or adopt new procedures and/or acquire new equipment for the use of the document for frontier control purposes, at least for some time. It is expected that a machine readable system and conventional passport procedures would need to operate in parallel for the foreseeable future.

7. The decision of countries to issue MRPs and/or to introduce machine reader facilities at their own entry points will be influenced by a number of considerations including the costs of introduction. Apart from the cost of production of the MRP itself, which may be a minimal additional cost if they are introduced as existing passports expire, the use of MRPs will cause no expense to be incurred by States not wishing to install and operate machine reading facilities. Where the use of machine readers and supporting equipment is contemplated, the costs and benefits will need to be assessed in relation to the number of regular entry points and their volumes of traffic. As the MRP may be introduced, and used with advantage, without the acquisition of any associated equipment or adoption of revised clearance procedures, States will choose to introduce the associated equipment according to local circumstances, where there is a net benefit to be gained.

8. A subsidiary aim under consideration during the development of the MRP was the desirability of standardizing the type of information and its layout in the conventional passport. The United Nations had made considerable efforts over many years towards this end but complete standardization has not been obtained as yet on a world-wide basis. Standardization in conventional passports would also be of assistance to passport control officials in clearing passengers, and States which do not adopt the MRP for the time being are therefore encouraged to include in their conventional passports control information in the same format and layout recommended for the MRP.

Advantages of the MRP over Conventional Passports

9. The MRP is expected to provide the holder with increased travel facilitation, particularly at busy airports which have introduced machine reading facilities. Not only will the use of the MRP

reduce the time otherwise taken for the visual inspection of conventional passports at clearance control points, but there is also the prospect that upon arrival or departure, an MRP holder will not be required to lodge Embarkation or Disembarkation Cards. It is expected that countries installing machine reading equipment would accept the data on the MRP as sufficient for their control purposes.

10. Where the clearance control system does not include machine reading facilities, time and expense will still be saved as the control official will find it easier to read the data which will be found on one page only, always in the same location as a result of standardization, and presented throughout in the characters shown in Appendix C rather than in handwriting as is often the case in conventional passports.

11. As machine readable passports may be expected to be only gradually introduced in years to come, it is essential that conventional passports retain the same status as MRPs for all immigration and security purposes and that States with machine reading facilities at their passport control points maintain adequate facilities, at the same time, for speedy processing of temporary visitors holding conventional passports.

Visas

12. The requirement for entrance visas, where this exists, complicates the issue of the MRP in the form of a separate card. ICAO and other international organizations have urged States for many years to take all necessary steps towards abolition of entrance visas for temporary visitors. Annex 9 to the Convention on International Civil Aviation contains the following provision:

> "3.7 **Recommended Practice.**— *Contracting States should extend to the maximum number of countries the practice of abolishing through bilateral arrangements or unilateral action, entrance visas for temporary visitors.*"

The United Nations Conference on International Travel and Tourism, held in Rome in 1963, adopted a similar Recommendation.

13. A considerable number of States have made appropriate arrangements for visa-free entry of nationals from other States making temporary visits of three months or less. Some States, in fact, are known to have made such arrangements with up to 80 other countries. At present, therefore, a high percentage of air passengers qualifying as temporary visitors no longer need to obtain visas for many of their journeys. On the other hand, there are States which, so far, have entered into visa abolition agreements with only a few other countries.

14. In cases where visas continue to be required it will be quite apparent that the production and use of the MRP in booklet form will facilitate the inspection of both the MRP and the visa because they will be presented in the same document. If, on the other hand, the MRP is produced as a free-standing card the endorsement of the visa would need to be made in a separate document. The disadvantages of this alternative will be obvious and the issue of the MRP in booklet form, allowing visa endorsements to appear in the same booklet, is much to be preferred.

Issue and Scrutiny of MRPs

15. It is essential that a very high degree of uniformity be achieved with regard to the issue and scrutiny of MRPs. Those States which are in a position to issue MRPs are urged to do so as soon as possible in accordance with the specifications contained in this document, and those States which are in a position to read MRPs by machine for clearance purposes should make appropriate

arrangements as soon as possible. Those States which are unable to issue MRPs in the immediate future are strongly encouraged to produce conventional passports with the data page following the recommended format and layout of the MRP.

FORMAT AND LAYOUT OF THE MRP

Dimensions of the MRP, its Various Zones, etc.

16. The MRP is divided into two parts, an upper part designed for visual inspection, which includes personal control information and the holder's photograph, and a lower portion designed for machine reading but which can also be read visually.

17. The following specification for MRPs is in accordance with Standard 2894 (B7 size) of the International Organization for Standardization (ISO) and was chosen to allow, on the one hand, for good readability of the items of personal information considered necessary and, on the other, for sufficient compactness to meet the convenience of the traveller. The overall prescribed dimensions are as follows:

width no less than 87.8 mm (3.46 in) and no more than 88.2 mm (3.47 in);
length no less than 124.8 mm (4.91 in) and no more than 125.2 mm (4.93 in);
thickness (excluding other booklet pages) no less than 0.254 mm (0.010 in) and no more than 0.635 mm (0.025 in).

The specifications for width and length refer to the outer limits of the document to be inserted into the machine. A 2 mm (0.079 in) margin clear of data must be left along each outer edge.

18. Since standardization of size, layout and the type of information to be included is an essential feature of the MRP, the specifications shown in Appendices A and B should be adhered to when producing MRPs.

The Zone for Visual Inspection

19. As indicated in Appendix A hereto, the following items of personal data are included in the visual inspection zone:

a) symbol to identify the MRP
b) code of issuing State
c) (passport) number
d) surname
e) given names
f) nationality of holder
g) date of birth
h) national registration/personal number (optional)
i) sex
j) place of birth
k) date of issue
l) date of expiry

In addition the title "Passport" and the name of the issuing State should appear at the top of the document. Furthermore, the holder's photograph must be included. There is also space for the holder's signature and the issuing authority's stamp and signature.

20. In issuing MRPs, titles identifying spaces where information is to be located should be printed, in addition to the language(s) of the issuing State, in English or French or both. Where a space is not used, no heading need appear.

21. In States where the roman alphabet is used, the characters as shown in Appendix C should be used in the visual zone, with 10 characters to the inch.* The maximum number of characters in each space is indicated by a number in brackets in each information field, as shown in Appendix A and in Column 1 of Appendix D.

Explanatory Notes on Various Items

22. The letter "P" in the space marked "Type" identifies the document as an MRP and is repeated in the machine readable zone to distinguish it from other documents which might be read with the same equipment.

23. Similarly the country code is given in the zone for visual inspection as well as in the machine readable zone. The code letters for use by each State are those contained in ISO Standard 3166, Section TWO, and Amendments thereto, consisting of a three-letter code for the State concerned.

24. Where a composite surname cannot be shown in full on the MRP owing to space limitations, the predominant one used by the holder should be inserted. The insertion of names in the MRP may present some difficulties, owing to the many different ways in which names are used in different parts of the world and the space limitations on the document.

25. Information concerning nationality is included on the MRP even though it will be issued in most cases to a national of the issuing State. Nationality is usually a basic control item for the State into which the holder is seeking temporary entry and a number of States may issue MRPs to other nationals residing in their territories.

26. In furnishing dates on the MRP, e.g. date of birth, the Gregorian calendar should be used and the information should be shown in the following standard manner in the zone for visual inspection**:

a) all days should be shown by a two-digit number, i.e. the dates from one to nine should be preceded by a zero; this number to be followed by a blank space;
b) the month should be shown in an abbreviated fashion not exceeding four letters, followed by an oblique character (/);
c) the translation of the month should follow its original version, again up to a maximum of four letters with a blank space thereafter;
d) the year should be shown in a two-digit number only.

As an example, the indication of birth dates on an MRP, issued in the Italian language with French translation, would appear as follows:

1	2		L	U	G		/	J	U	I	L		4	2

27. Indication of the holder's sex should be made by inclusion of the single initial commonly used in the language of the State of issue, followed by a dash and this in turn followed by the letter M or

* 1 in = 25.4 mm.

** As regards inclusion of dates in the machine readable zone, see Note to Appendix D.

F in the case where a translation of data into English or French is necessary. For the machine readable zone, however, only one space has been set aside and the letter M or F must be shown there.

28. In cases where the MRP is issued to a person whose place of birth was outside the State issuing the document, and it is desired that the country of birth be indicated, this should be done by using the official spelling adopted by the United Nations for designation of States.

29. The photograph of the bearer should meet the requirements of the issuing State but should, in any event, fill the entire space reserved for it, i.e. 45 mm x 35 mm (1.77 in x 1.38 in). It is recommended that the length of the image of the subject's face be between 25 mm and 35 mm (1 in and 1.38 in), measured from chin to crown of head.

The Machine Readable Zone of the MRP

30. It is essential that the data page of the MRP booklet face outwards, with the machine readable zone along the outer edge of the page, i.e. away from the "spine" of the booklet. Should a State issuing the MRP elect to include the machine readable zone on the reverse of the side containing the visual inspection zone, steps should be taken to ensure that its position corresponds exactly to the space specified for the machine readable zone on the front, as difficulties could otherwise arise in the process of machine reading.

31. Most of the data in the visual inspection zone are repeated in the machine readable zone. The method of rendering the document machine readable should be OCR 'B', size 1 (Optical Character Recognition Font B) spaced at 10 characters to the inch, conforming to International Organization for Standardization (ISO) Standard 1073/II. The character set is shown at Appendix C. The print quality and tolerance of character positions must conform to ISO Standard 1831.

32. The data to be machine read should be arranged from left to right in fixed length fields in two lines in the order specified in paragraph 35 below and in Column 2 of Appendix D, and located on the document as defined in Appendix B. Data should be entered in each field beginning with the left-hand character position. The right-hand character position in each numeric field should be occupied by the check digit. Where information does not require all the character positions allowed in the field, the redundant positions should be occupied by the symbol < as shown in Appendix C. The first and last character in each line must be at least 6 mm (0.25 in) from the nearest edge of the document.

33. The machine readable zone must be such that no interference is caused to accurate machine reading. For this purpose the machine readable zone, whatever the constituent materials of the MRP, should meet ANSI* X3.17-1977, paragraphs 4.2.1.3 and 4.2.1.4, or equivalent ISO standard.

34. The final figure in all numeric fields must be a check digit calculated as shown in Appendix E. The final digit in the lower line of the machine readable zone is based on all numeric fields (including their check digits).

Items to be included in the Machine Readable Zone

35. For machine reading it is essential to standardize the presentation of information to be included in the machine readable zone. This includes the exact placing of these data in that zone

* ANSI = American National Standards Institute.

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and the exact position of the machine readable zone on the MRP (having regard also to the contents of paragraph 30 above). The machine readable zone should contain the following data in that order:

Upper line

a) letter "P" to identify the document as an MRP;
b) code of issuing State (cf. paragraph 23);
c) name (surname and all other names up to 39 letters);

Lower line

d) passport number and check digit;
e) nationality of holder (cf. paragraph 25);
f) date of birth and check digit;
g) sex (cf. paragraph 27);
h) date of expiry and check digit;
i) national registration/personal number (optional) and check digit;
j) final check digit.

Space allocation of characters providing the above control data will be governed by the specifications listed in Column 2 of Appendix D.

SECURITY CONSIDERATIONS AND PHYSICAL CHARACTERISTICS

Security Considerations

36. Careful consideration should be given to the materials to be used for producing the MRP. As indicated in paragraph 5, it should incorporate safeguards equal to or better than the conventional passport, both in terms of the medium as well as the entire system of operation. An MRP produced by using security paper as a base which, after completion, is to be laminated, might have to be protected against falsification by the incorporation in such paper of watermarks or the use of security printing techniques such as the guilloche method or intaglio printing, whereas those in which information is embedded directly in the plastic material by a photographic process might need to be protected through other means, for example, by the insertion of fibres having certain optical properties.

37. Each State should determine the security features required to achieve a satisfactory standard. Nevertheless, the following guidelines should be observed in producing the MRP so that:

a) any attempt to alter a genuine document in any way would result in its virtual destruction or render such alteration clearly manifest to the eye; such alteration might also be detectable by the mechanical or automated processes entailed in its scrutiny;
b) any attempt to create counterfeit MRPs which would be visually acceptable and able to pass automated inspection, would be unattractive to potential criminal elements; this may be accomplished by making it most difficult to acquire production equipment and materials illegally and by involving a high degree of technical expertise in the production of MRPs; and
c) any security feature incorporated in the document does not interfere with accurate machine reading.

Physical and Material Characteristics of the MRP

38. While each State is left free to decide what kind of basic material it wishes to use for producing the MRP, the following minimum characteristics should be inherent in whatever material is selected so as to give it a life span of at least five years.

39. The document must be of such nature that deformation due to normal use (bends, not creases) can be reduced to flatness by the reading device without impairing the use of the document or the functioning of the reader.

40. The document must present no toxic or other hazards in the course of normal usage.

41. The print quality should remain up to the standard given in paragraph 31 at operating temperatures ranging from −10°C to +50°C. The document should not lose its reliability after being stored at temperatures ranging from −35°C to +80°C.

42. The document should be reliable in operation at a relative air humidity of 5 per cent to 95 per cent with a maximum wet bulb temperature of 25°C. The document should not lose its reliability when stored at a relative air humidity of 0 per cent to 100 per cent.

43. The document should maintain the above properties during normal use throughout its period of validity.

PROCEDURES AND SYSTEMS FOR USE IN CONNEXION WITH THE MRP

Equipment for use at Clearance Control Points

44. Equipment required at clearance control points and the procedures to be followed will be designed to meet the requirements of the receiving country, reflecting the legislative provisions and the administrative policies of that country.

45. The requirements will differ considerably from country to country. For example, some countries may wish to record the inward and outward movements of all categories of travellers; some countries may wish to record the inward and outward movements of some categories only; and others may be concerned only with partial controls for specific groups.

46. For these reasons, it is unlikely that there will be uniformity in the inspection procedures followed by various countries, nor in the systems comprising various units of equipment. However, certain items of equipment, e.g. MRP readers, would necessarily need to have some standard characteristics and specifications, although they need not be of the same manufacture.

47. Each country adapting the standardized MRP with machine readable capability to its own purposes in admission control, will decide on the nature and composition of the equipment needed to achieve these purposes.

48. As mentioned earlier, the MRP, when issued in accordance with the specifications in this document, may be used at clearance control points in two different ways: it may be read visually or by machine. Obviously, no equipment is needed for the first of these alternatives. Machine readers installed at clearance control points may be connected through an interface to a variety of computing equipment.

COSTS ASSOCIATED WITH THE PRODUCTION AND USE OF THE MRP

Costs of producing the MRP

49. The cost of producing the MRP could vary significantly between States. Amongst the determining factors, to name only a few, are the availability of some or all of the basic materials or equipment on the local market or alternatively the need to import them, the local wage scales prevailing in the issuing State, the degree of complexity of the production equipment selected, the number of MRPs produced each year, the degree of security built into the product, and the degree of centralization or decentralization of production. As a general observation, it would appear that the cost of producing the MRP may not be significantly different from that of producing the conventional passport.

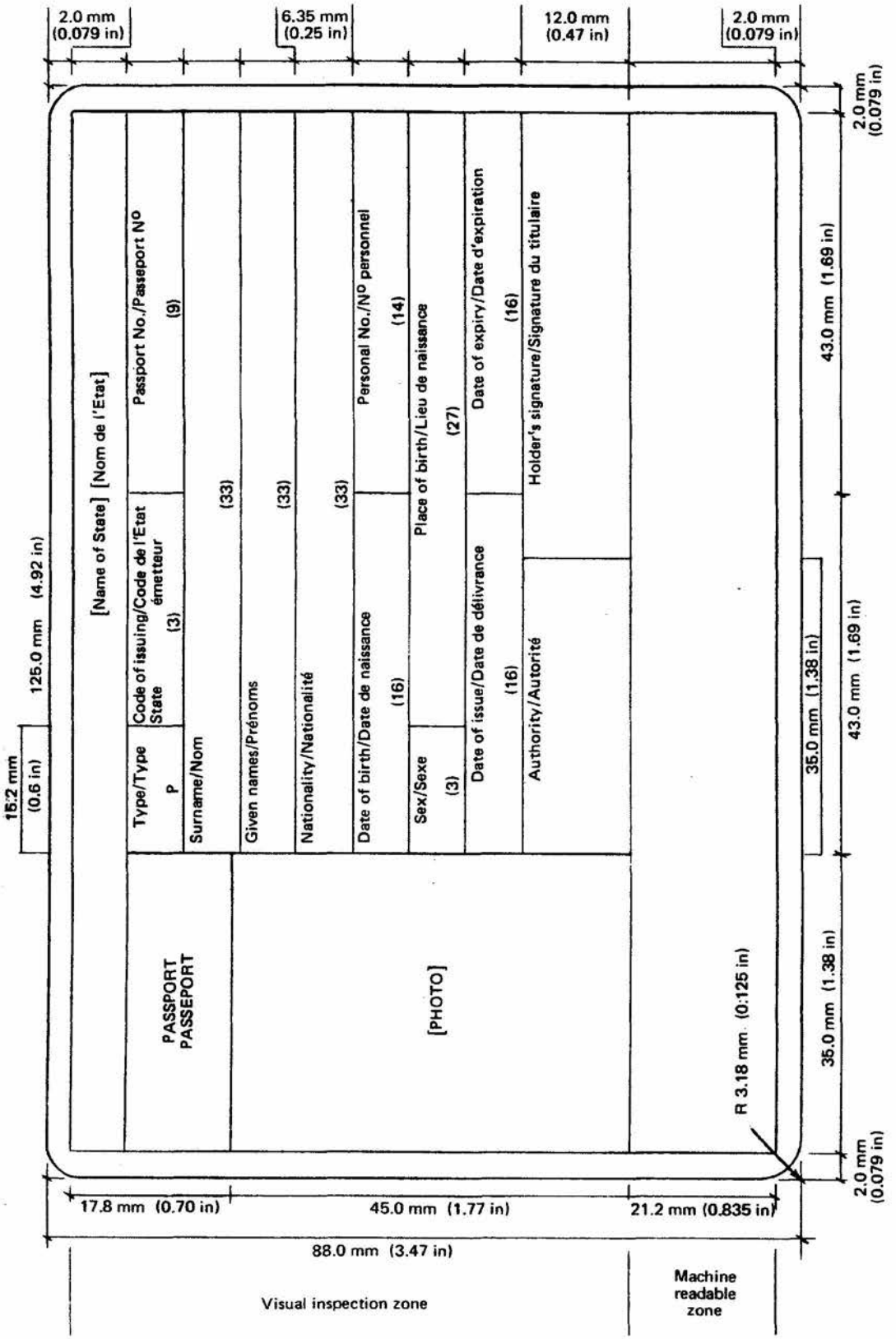
Costs of using the MRP

50. Visual inspection of the MRP by clearance control officials requires no equipment and no variation in operational costs therefore arise.

51. The cost of machine reading of the MRP will vary from one State to another, depending, *inter alia*, on place of manufacture of the equipment, number of readers put into operation, training costs, if any, and the types of readers utilized. When the question of cost was discussed by the Panel of Experts in 1978, it was apparent that the cost of computer equipment, associated with machine reading units at clearance control points, would vary considerably, depending upon the needs of individual States. At that time, the cost of the basic reading unit was estimated to be in the order of U.S.$3 000.00.

APPENDIX A

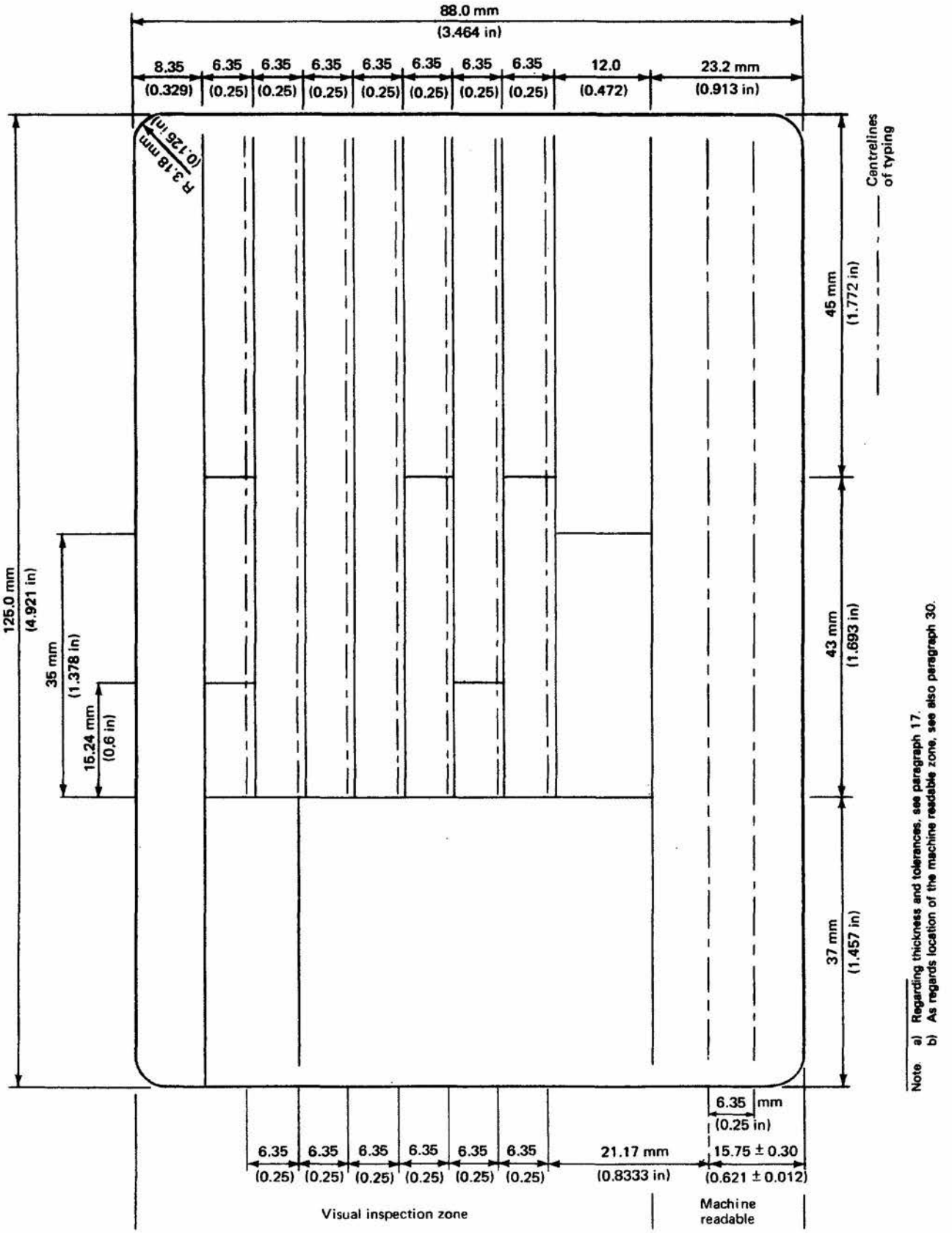
FORMAT AND LAYOUT OF THE DATA PAGE



Note. a) Numbers in parentheses refer to unit spaces available for OCR-B type lettering (see Appendix D).
b) All lines on the document are intended to indicate the location of the respective fields and may be omitted at the discretion of the issuing State.
c) Regarding thickness and tolerances, see paragraph 17.
d) As regards location of the machine readable zone, see also paragraph 30.

APPENDIX B

MEASUREMENTS FOR DATA LOCATION



APPENDIX C

CHARACTER SET OCR-B1

(Complete character set)

SCALE 4 : 1



SCALE 1 : 1

APPENDIX D

SPACE ALLOCATION OF CHARACTERS IN THE TWO ZONES OF THE MRP

Field	Number of Character Positions		
	1 Visual Inspection Zone	2 Machine Readable Zone	
Type	2	2	Upper line
Code of Issuing Country	3	3	Upper line
Surname	33	39	Upper line
Given Names	33		
Passport Number	9	10*	Lower line
Nationality	33	3	Lower line
Date of Birth	16	7*	Lower line
Sex	3	1*	Lower line
Place of Birth	27	—	Lower line
Date of Issue	16	—	Lower line
Date of Expiry	16	7*	Lower line
Holder's Signature	51 mm × 12 mm	—	Lower line
Authority	35 mm × 12 mm	—	Lower line
Personal Number†	14	15*	Lower line
Check Digit+		1	Lower line

* Including check digit
† Optional
\+ Calculated on all numerical fields as defined (see Appendix E)

Note. In the machine readable zone, dates are to be shown by two digits each for year, month and day, in that sequence.