What Is the Optimal Location for the Micro Controller Chip in an ePassport?

INTRODUCTION

Many recent ePassport project upgrades have revolved around the introduction of a new laser engravable polycarbonate (PC) datapage. This trend is likely to continue, as governments look to enhance the security of their passport programs. However, the choice of location for the chip has not been the same across projects. Depending on the previous generation of passports, the size of the project or simply the technology choices, the question of where to embed the microchip and its antenna has been answered differently. This has left governments to choose between the chip in the cover or embedding the chip in a PC datapage.

This white paper will examine the factors that influence the choice of location for the chip.

WHITE PAPER

Standards Give Flexibility On Chip Location

The design of passports is governed by the International Civil Aviation Organization (ICAO) 9303 standard, which sets the ground rules for Machine Readable Travel Documents (MRTD). The standard gives a number of options for the position of the chip, as shown in Figure 1 below, leaving the choice of location open.

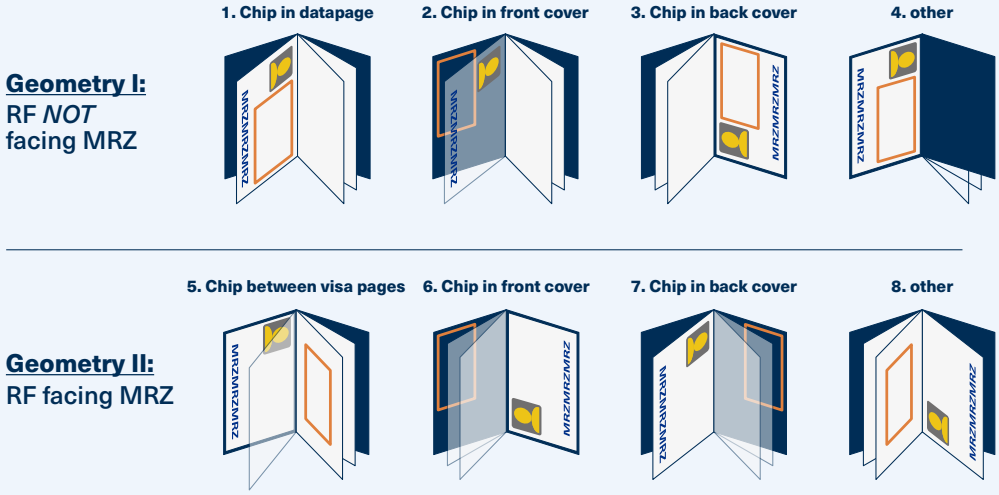

Figure 1. Options for locations of the chip

In practice, two options have prevailed:

- The chip is embedded within a polycarbonate datapage
- The chip is located in the back cover of the booklet with the polycarbonate datapage used for visual personalisation only

Four Factors Influence the Location of the Chip

BOTH CONFIGURATIONS PRESENT BENEFITS AND DRAWBACKS.

1. Security Feature Dissemination

ICAO 9303 recommends the inclusion of a combination of a range of security features and techniques to provide optimal security for a travel document. Within this recommendation, ICAO says that the best protection is obtained from a balanced set of features and techniques that provide multiple integrated layers of security in the document that combine to deter or defeat fraudulent attacks. For that reason, it is recommended to deploy security features all around the document. Later on, it is also mentioned that in order to protect against the substitution of the entire datapage in a passport, it is recommended to employ a combination of security features and distribute them instead of relying on a single feature.

The polycarbonate datapage displays the laser engraved personal details of the document holder and the digital version of that data is stored securely in the chip. If the chip is embedded in the polycarbonate datapage and the datapage is substituted, both the digital and physical security of the travel document is compromised at the same time. For this reason, it is advised to duplicate the personalized data of the passport holder inside the document between two booklet components i.e. the datapage and the cover.

When opting for a chip inside the cover, additional security can be implemented which is generally only available for the eCover. By integrating an RFID shield for example, the chip is protected from being read when the passport booklet cover is closed.

In terms of distributing the security features equally within a passport, the conclusion is that having an eCover with a PC datapage is the most secure option.

2. Datapage Thickness and Deformation

An electronic PC datapage has an increased thickness due to the presence of the chip within it. The thicker the PC datapage, the less flexible it becomes. This lack of flexibility can lead to cracking of the datapage due to a mismatch in physical properties where the polycarbonate meets the metal structure the chip. In the most extreme cases this cracking can lead to breaks in the connection between the antenna wire and the chip. This can be potentially managed via the integration of an additional crack prevention feature in the datapage.

Given the above, especially without an anti-crack feature, a PC datapage is less likely to resist deformation due to bending of the document; for example, when travellers carry it in the pants pockets or bags. This affects its durability in the long run over the five to ten years the product is expected to last.

A thick PC datapage can affect the aesthetics of the overall passport, as a bulky datapage would not allow the booklet to close properly, bringing an impression of lower quality to the holder. On the other hand, an ePassport with an eCover and a PC datapage will also display thicker covers and end pages. It is in that case more a matter of preference than an objective comparison.

The conclusion is that an eCover with a PC datapage is slightly sleeker and therefore the more attractive option.

3. Passport Sourcing Strategies
Another important consideration is how the passport components are procured for a given project.

For authorities sourcing complete booklets from a single entity, there is no real difference between choosing an eCover plus PC datapage or an electronic PC datapage, since the job lies with the supplier to manage the most cost-effective option for the passport authority.

However, for the national printers who assemble the finished booklet from components sourced externally like the eCover or the PC datapage, having a single supplier of one complete electronic PC datapage is easier and slightly more cost effective. Having two separate procurement exercises and supply chains brings double the risk.

Therefore, when it comes to passport sourcing strategies, the slight winner is the electronic PC datapage.

4. Previous Generation of Passport
Finally, the choice between a passport with an eCover and a PC datapage against an electronic PC datapage depends largely on the existing passport already in place. Countries moving from a non-electronic passport to an ePassport are free to explore both options.

Countries that migrated to an ePassport earlier generally implemented an electronic cover, as that was the first option available when the ePassport trend started. It is the most proven technology, and it came before the introduction of PC datapages a few years later. With that in mind, it is understandable that the choice might lean toward keeping the existing eCover in a current passport assembly line rather than creating a completely new document. In this case, a simple upgrade from paper datapage to PC datapage would be the only change.

Conclusion: There Is No Right or Wrong Location for the Chip

There are two locations for the chip in a passport containing a PC datapage. Both of these options are proven in the market. Where a particular country chooses to put the chip is influenced by a number of factors, each of which will be viewed uniquely by that particular government. Ultimately, the best location is the one which suits that country.

If you want to learn more about migrating from MRP to ePassport visit:
https://campaigns.hidglobal.com/epassport

HID
hidglobal.com

North America: +1 512 776 9000 | Toll Free: 1 800 237 7769
Europe, Middle East, Africa: +44 1440 714 850
Asia Pacific: +852 3160 9800 | Latin America: +52 (55) 9171-1108
For more global phone numbers click here

2021-04-28-cid-chip-location-electronic-passport-wp-en PLT-05931
Part of ASSA ABLOY