

Status of Personalized Handgun Technology
Twenty-Fourth Annual Report

Public Safety Article, Section 5-132

Maryland Department of State Police
July 1, 2025

Maryland Handgun Roster Board Twenty-Fourth Annual Report on the Status of Personalized Handgun Technology

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About the Report

The Maryland Handgun Roster Board is legislatively mandated to report annually on the status of personalized handgun technology. This requirement was part of the Responsible Gun Safety Act of 2000, and is now in the Public Safety Article, §5-132(d,) Annotated Code of Maryland. The following report from the Maryland Handgun Roster Board seeks to address and satisfy this requirement.

The report documents the findings of the review of Personalized Handgun Technologies as conducted by the Maryland Handgun Roster Board. The Board conducted the review through research and examination of publicly available resources including articles, reports, and documents that the Board was able to identify, and did not commission any independent analysis. The Board reviewed a set of references that was as comprehensive as possible given the Board's limited resources, but the references reviewed should not be considered an exhaustive list of all possible items related to personalized handgun technology.

Executive Summary

Review completed by the Board indicates as of June 2025, there is currently one firearm with personalized handgun technology available for sale in the state of Maryland. Beyond Maryland, Free State Firearms LLC is reported to be selling a 1911 style pistol with RFID technology. The Sentry Pistol from Free State Firearms LLC has not been presented to the Handgun Roster Board for review or approval therefore the Board is unable to make an assessment as to the technology in the firearm and can only report on what is publicly available. The Handgun Roster Board notes that while other companies are pursuing firearms with Personalized Handgun Technologies, Biofire Technology and Free State Firearms LLC appears to be the only companies currently selling, or close to selling firearms with Personalized Handgun Technology.

Additionally, while the Biofire Technology handgun was approved for sale in Maryland by the Handgun Roster Board in December 2024 it was not without objection¹. Several questions about the usefulness and effectiveness of the technology were raised and the Board's approval of the firearm for sale should be viewed as a determination as to the firearm's compliance with Maryland Code of Regulations 29.03.03.10 and not a judgement of the Board's approval or support of the Personalized Handgun Technology in the firearm. The Board's approval of the Biofire Technology handgun should be viewed as a determination the firearm is acceptable for public use, not that it is safer or better than any other firearm.

The National Institute of Justice continues to provide the most detailed analysis and reporting on personalized handgun technology and their report "Review of Gun Safety Technologies" published in June of 2013 is the most recent report of significance that stakeholders should reference on the topic. While some parties have exited the Personalized Handgun Technology arena and other parties have entered, the overall number of parties and effort working in this area does not appear to have changed significantly from recent years.

Section 1 – Personalized Handgun Technologies Available for Sale

As of June 2025, there is currently one firearm with Personalized Handgun Technology available for sale in the State of Maryland, and one firearm reported to be for sale but has not yet been petitioned for sale in Maryland. The manufactures of these firearms have not disclosed sales volumes of the firearms, but it appears that their distribution and usage is still limited and not widely available as they are still being sold through limited online channels. However, while availability of Personalized Handgun Technology is limited, this past year has been a turning point for the technology as the industry has gone from having zero to having two handguns with Personalized Handgun Technology. Over the past several years these two manufacturers have shown the most progress in bring the technology to market and that continues to remain the case as no other manufacturers are reporting, appear to be developing, or are marketing that they are close to selling Personalized Handgun Technology.

It continues to be observed that all the parties currently developing personalized handgun technology are smaller companies and that no major firearms manufacturer has publicly disclosed current or future plans to develop or bring to market personalized handgun technology. While major firearms manufacturers like Colt, Remington, and FN have previously

1. MD Handgun Roster Board Meeting Minutes
<https://mdsp.maryland.gov/Organization/Office%20of%20Equity%20and%20Inclusion/Pages/CriminalInvestigationBureau/LicensingDivision/HandgunRoster/Minutes%20Dec%204%202024.pdf>

indicated they were working on personalized handgun technology it continues to appear that none of them have continued such work. The reason(s) for this are not objectively known, but it does support the broader observation that personalized handgun technology is not likely to be widely commercially available in the near future.

In December 2024 the Board approved for sale in Maryland the Biofire Technologies handgun called The Biofire Smart Gun® making it the first and only handgun available for sale in Maryland with Personalized Handgun Technology. The firearm is a 9mm semi-automatic pistol which utilizes biometric sensors including fingerprint and face recognition to provide Personalized Handgun Technology². Biofire hosted multiple calls with members of MDSP and the Maryland Handgun Roster Board to share some of the details of their firearm, and the details presented by Biofire align with the information from their website and recent media campaign of videos and articles about their product. The package prices being offered for sale start at \$1,499 and go up based on accessories and options. To date the company has not disclosed sale volumes and sales are currently only available through the manufacturer's website.

During the review of the Petition for the addition of the Biofire Smart Gun to the Handgun Roster Board members reviewed the firearm against the criteria outlined in Maryland Code of Regulations 29.03.03.10 for possible inclusion on the Handgun Roster as that is the jurisdiction of the Board, the Board did not make a judgement on the quality, effectiveness, or usefulness of the Personalized Handgun Technology in the firearm as that was not the petition before the Board. In approving the firearm for inclusion on the Roster the Board found that the firearm aligned with the criteria in Maryland Code of Regulations 29.03.03.10 and was safe for use and sale in Maryland, however that does not imply that the firearm is any safer or better than any other firearm approved for sale in Maryland.

Board members had several observations about the Biofire Handgun worth noting. Per the testimony from the Biofire representatives, and supported by documentation on their website³ the primary use of the firearm is limited, and is intended to primarily be used for in-home self-defense and range shooting due to the large size, weight, and charging needs of the handgun. The company does not offer for sale a holster, and combined with the form factor is not suitable for Law Enforcement duty carry, or self-defense outside the home wear and carry. The company did indicate that they are exploring how to evolve the technology and potentially expand the uses in future products. Biofire was asked about third-party verification testing, including software and hardware intrusion testing, to validate the security and reliability claims

1. Biofire Technologies Inc, <https://smartgun.com/technology>

2. Biofire Technologies Inc, FAQ <https://smartgun.com/faq>

made by the company, and they were unable to provide those tests and/or not willing to disclose publicly that they had engaged third parties to perform such testing. These types of tests would be best practices before adopting electronically based Personalized Handgun Technology such as this. Additionally, Biofire Technology varies from other Personalized Handgun Technology in that handgun prevents unauthorized usage not by blocking the mechanical action of the handgun like other previous designs, but rather by electronically triggering the firing of the handgun via automated controls. This design introduces a unique concern that users could by-pass the electronic controls by “hacking” the software or hardware to either circumvent the user authorization or create new firing modes such as “burst” or “fully automatic” fire effectively making it a machine gun. This concern is based upon analogues issues presented by 3D printed guns (a.k.a. “ghost guns”) where tech savvy users can leverage technology to quickly circumvent gun designs and share those capabilities on-line. This type of capability is already seen with paintball guns where users can readily purchase aftermarket circuit board and swap out factory controls for fully automatic firing controls, while paintball guns are not firearms (it is not illegal to make such modifications on paintball guns) the concept could readily be applied to firearms which would create a significant legal and potential safety concern. Finally, concerns were raised with the Personalized Handgun Technology in this firearm because it creates a barrier to law enforcement crime investigations because the personalized technology would prevent Law Enforcement investigators from test firing the firearm. The Personalized Handgun Technology by design would prevent any users including Law Enforcement Investigators from firing the handgun and if the company were able to provide a “bypass” to the technology, similar to access granted by Apple with the i-phone, then that would be acknowledging that the technology can be by-passed making it ineffective. The above concerns are introduced through the addition of the Personalized Handgun Technology and need to be examined and explored as the technology moves toward wider adoption.

In November 2024, the Kansas based company Free State Firearms LLC (formally SmartGunz LLC) announced a dealer partnership and sale of their Sentry pistol⁴. The Sentry pistol is a 9mm 1911 style handgun with SentryGunz’s patent pending lock-out technology which utilizes RFID ring worn by the user to achieve personalized handgun functionality. The handgun is only available for sale through their partner dealer, The Gun Guys II in Ottawa Kansas, and is

3. Holland, Free State Firearms, LLC Announces Dealer Agreement with The Gun Guys II (Ottawa, KS). <https://freestatefirearms.co/category/news/>

currently available for order with a retail price of \$3,495⁵. The Sentry Pistol has not been presented to the Maryland Handgun Roster Board for review and is not currently on the approved firearms list for sale in Maryland, all information about this firearm is limited to materials published publicly by the manufacturer. The company has not disclosed sales figures for the Sentry pistol.

Pennsylvania based company Lodestar Works Inc. had previously announced plans to introduce a 9mm pistol with personalized handgun technology called the LS9. This firearm reportedly utilizes grip sensor, RFID, and Bluetooth technologies to implement personalized handgun functionality. The company reportedly is beta testing the product and originally announced it expected to have it commercially available in 2022, but it is currently not available⁶ and updates from the company have virtually ceased indicating the company may no longer be working on the technology.

The German company Armatix GmbH has expressed interest in selling their .22 caliber iP1 pistol model in 2014, and their 9mm iP9 in 2016, however to the best of the Board's knowledge the company never sold the product in the United States, and it is unclear if the company has any further plan to pursue sales of their product⁷.

In 2013, the Utah based company Kodiak Industries expressed interest in selling their .45 caliber *Intelligun* technology using fingerprint recognition⁸, however to the best of the Board's knowledge the company never sold the product and it appears the company does not have any further plan to pursue sales of their product as it appears the company is no longer in business.

In the late 1990's, iGun Technology Corporation of Florida developed a shotgun using an RFID ring that could be classified as personalized handgun technology, however to the best of the Board's knowledge the company never sold the product, and it is unclear if the company has any further plan to pursue sales of their product⁹.

5. Gun Guys II / Handguns, <https://shop.thegunguys.net/handguns/semi-automatic-handguns/custom-built-rfid-premium-handgun-5002426>

6. <https://smarttechfoundation.org/smart-firearms-technology/lodestar/>

7. Alex Yablon, "With New Smart Gun, Industry Pioneer Bets Bigger Is Better", TheTrace, Mar 2, 2017, <https://www.thetrace.org/2017/03/new-armatix-smart-gun-law-enforcement/>

8. "Intelligun(R) Brings Innovation and the Next Level of Firearm Safety Technology to the World at the 2013 SHOT Show(R)", Yahoo Finance, Jan 15, 2013, <https://finance.yahoo.com/news/intelligun-r-brings-innovation-next-144500480.html>

9. iGun Technology, <https://www.iguntechnology.com/faq/index>

Section 2 – Study, Analysis or Evaluation of Personalized Handgun Technologies

The Board is not aware of any additional publicly available Study, Analysis or Evaluation of Personalized Handgun Technologies since 2013, while dated the Board continues to report on last available items it is aware of below to address the requirements for the report.

The National Institute of Justice (NIJ) is the research, development, and evaluation agency of the U.S. Department of Justice. NIJ has been tracking, studying, and assessing personalized handgun technology dating back to the 1990's. Over the years they have produced detailed reports relating to the various personalized handgun technologies and companies seeking to produce products with these technologies. They have also assessed the impacts, reliability demands, and challenges to adoption within law enforcement and the civilian populations. NIJ's reports are some of the best resources for stakeholders to reference with regards to personalized handgun technology. NIJ reports and documents relating to "Smart Guns" can be found here <https://nij.ojp.gov/taxonomy/term/21231>.

The most recent notable report from NIJ is from 2013 entitled "Review of Gun Safety Technologies". This review outlines the products and technologies that were available at the time which include many of the products highlighted above in section 1 of this report. NIJ outlined and assessed various technologies under development but ultimately made similar conclusion to this Board in that there were no commercially available products with personalized handgun technology¹⁰. The report also provided a perspective on the risk and reliability of personalized handgun technology acknowledging that concerns regarding the reliability and potential performance of personalized handgun technologies will affect user acceptance and that personalized handgun technologies must not adversely affect the reliability of firearms¹¹.

While the NIJ report from 2013 remains the most recent and comprehensive study the Board has reviewed, there are several other reports that while dated or less comprehensive, remain worthy of note for reference including:

- Smart Gun Technology Requirements Preliminary Report by Sandia National Laboratories in 1995. <https://www.osti.gov/servlets/purl/71695>
- Secure Weapon System Smart Gun Technology Phase I report by FN Manufacturing in 2001. <https://www.ojp.gov/pdffiles1/nij/grants/189247.pdf>

10. Mark Green, Ph.D., *A Review of Gun Safety Technologies*, National Institute of Justice, June 2013, <https://www.ojp.gov/pdffiles1/nij/242500.pdf>

11. Mark Green, Ph.D., "A Perspective on Risk, Reliability, and Person-Centric Technologies" in *A Review of Gun Safety Technologies*, Page 19, June 2013, <https://www.ojp.gov/pdffiles1/nij/242500.pdf>,

- Gun Safety Technology Challenge conducted by NIJ in 2015.
<https://nij.ojp.gov/funding/gun-safety-technology-challenge#publication>

The Board has not been made aware of any other state, local, law enforcement or other agencies having conducted or publishing studies or evaluations of personalized handgun technology in the recent past.

Section 3 – Additional Relevant Information

The Board has identified three additional relevant topics on the subject of Personalized Handgun Technologies. First, the Board is aware of various concerns with Personalized Handgun Technology that should be considered. Second, during discussions with Biofire Technology it was learned that Biofire Technology is advocating against and warning about the possible negative unintended impacts of mandates for firearms with Personalized Handgun Technology. Third, as reference the Board continues to track and report a list of organizations of interest related to the development of Personalized Handgun Technologies.

Concerns related to Personalized Handgun Technology

While the potential benefits of Personalized Handgun Technology are straight forward and commonly understood, the downsides or unintended consequences are less obvious and should also be understood. During the Board’s review and assessment of the Biofire Technology handgun in December 2024, some Board members raised concerns about usefulness, application, and effectiveness of Personalized Handgun Technologies specifically with the Biofire Technology handgun but also more broadly in concept as a whole. Below is a summary of some of the concern and comments the Board is aware of:

- The introduction of electronics, or even additional mechanical components, into a firearm inherently create reliability concerns potentially preventing the firearm from performing when needed, thereby creating safety concerns if the firearm is depended upon for self-defense or law enforcement situations.
- The use of batteries to power the technology also creates both a reliability and usability concern as batteries are prone to failure and introduce their own chemical and fire safety concerns.
- Currently Maryland has safe gun storage regulations to ensure that firearms are safely stored and locked to prevent theft and unauthorized use. The integration of Personalized Handgun Technology into firearms has two potential concerns related to

safe storage. First, some manufacturers including Biofire envision users storing their firearms in the open, not in safes, relying upon the integrated Personalized Handgun Technology to provide the necessary safety. It is not clear how this would comply with Maryland regulations. Secondly, the integrated Personalized Safety Technology may give users a false sense of security making owners less likely to properly store or lock their firearm as evident by the marketing of the Biofire handgun as a firearm that can be stored in the open in a living room, this raises possible safety concerns going forward.

- As noted above with the Biofire handgun, the introduction of electronic fire controls to achieve Personalized Handgun Technology make the firearms susceptible to hacking and tampering to circumvent the controls, or possibly even introduce new capabilities such as fully automatic fire controls. This is not limited to electronic Personalized Handgun Technology as similar observations have been seen with mechanical interlock controls where the capabilities can easily be bypassed by removing or modifying components. This concern highlights that the benefits of the technology may not be realized, or at least significantly reduced, if users can easily bypass the technology.
- With the variants of technology currently presented, each firearm appears to only fit a small and specific use case for users. For example, the Biofire technology while potentially useful for home defense, could not be considered for many other use cases such as hunting, Law Enforcement, or self-defense outside the home. The Free State Firearms technology with RFID rings could potentially be used in duty or wear and carry capacity, but would not fulfill self-defense in the home, hunting, or other use cases. This may change as the technology advances, but this inherent limitation is likely to prevent widespread user adoption and acceptance, and/or lead to increased firearm sales as user may need multiple firearms to satisfy multiple uses.

Biofire Technology warning against Smart Gun Mandates

During reviews and discussions with Biofire Technology the Board was made aware of the position taken by Biofire Technology on the subject of legislative or regulatory mandates for the adoption of Personalized Handgun Technology, a.k.a. “Smart Gun Mandates”. Without solicitation Biofire Technology made it a point to share their position and make the Board aware of their advocacy in opposition to legislative mandates because in their assessment such regulations counter intuitively limit, slow or prevent the adoption Personalized Handgun Technology and therefore such regulations or mandates should be avoided¹². Biofire Technology has gone on record in multiple states and testified to this opinion and often sights the regulations in New Jersey, which have since been repealed, as a clear example of how the development of this technology has been hindered by such regulations and

12. Biofire Technologies llc. Biofire’s Stance on Mandates <https://smartgun.com/explore/videos/biofire-s-stance-on-mandates>

mandates. Biofire's positions are publicly available for review online and Biofire has previously expressed willingness to engage in similar future discussions if requested.

Further reflecting on this position there is evidence supporting this claim in the Board previous reporting and observed development of the technology over time. For several years after the implementation of this report, the Board had little to no updates to provide as the industry and technology were virtually nonexistent. It hasn't been until the past few years when the Board has observed notable changes in that pattern roughly corresponding to when the New Jersey Smart Gun Mandates were repealed, suggesting there is evidence to support Biofire's position that the mandates actually worked against the intended goal of improving public safety through Personalized Handgun Technology.

List of Organizations of Interest

This report does not seek to be a comprehensive reporting of all industry development; however, the Board has been made aware of various companies working on personalized handgun technology. For reference, a list of companies or groups reportedly working on developing personalized handgun technology can be found below:

- SmartGunz LLC - <https://smartgunz.co/>
- Free State Firearms LLC - <https://freestatefirearms.co/> (previously SmartGunz LLC)
- LodeStar Works - <https://lodestarworks.com/>
- Armatix GmbH – website no longer active (<http://armatixus.com>)
- Kodiak Industries – website no longer active (<http://kodiakarms.com>)
- Biofire Technologies Inc - <https://biofire.io/>
- iGun Technology Corporation - <https://www.iguntechnology.com/>
- Machine Inc. - <https://machine.tech>
- New Jersey Institute of Technology - <https://www6.njit.edu/news/spotlight/2005/jan/index.php>
- Colt Manufacturing - <https://www.colt.com/>
- FN Herstal - <https://fnherstal.com/en/>

Membership of the Maryland Handgun Roster Board as of July 1, 2025

Colonel Roland L. Butler, Jr., Chair	Superintendent, Dept. of State Police
Major Andy Johnson (designee)	Dept. of State Police
Mr. Ivan Bates	Representative of the Maryland State's Attorney Association
Mr. P. Michael Errico	Citizen member
Dr. Cassandra Crifasi	Citizen Member
Ms. Kim Dennis	Citizen Member
Mr. Jonathan Maurath	Mechanical/Electrical Engineer
Mr. Alexander Kohn	Mechanical/Electrical Engineer
Mr. Carl Roy	Representative of handgun dealer, gunsmith or handgun manufacturer
Mr. Daniel Popp III	Representative of the National Rifle Association
Mr. Robert Bajefsky	Representative of an organization that advocates against handgun violence.
Chief Michael Spaulding	Representative of Association of Chiefs of Police

Appendix

Maryland Code Public Safety

Title 5 – Firearms

Subtitle 1 - Regulated Firearms

§ 5-132. Handgun safety devices

(d) Report.

(1) The Handgun Roster Board annually shall:

(i) review the status of personalized handgun technology; and

(ii) on or before July 1, report its findings to the Governor and, in accordance with § 2-1246 of the State Government Article, to the General Assembly.

(2) In reviewing the status of personalized handgun technology under paragraph (1) of this subsection, the Handgun Roster Board shall consider:

(i) the number and variety of models and calibers of personalized handguns that are available for sale;

(ii) each study, analysis, or other evaluation of personalized handguns conducted or commissioned by:

1. the National Institute of Justice;

2. a federal, State, or local law enforcement laboratory; or

3. any other entity with an expertise in handgun technology; and

(iii) any other information that the Handgun Roster Board considers relevant.