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HB910 and SB958
OPPOSE

I am a defense contractor whose current and prior employers include one of the top research laboratories in the United States and one of the leading aerospace corporations in the world. In my spare time I enjoy shooting sports, 3D printing, and amateur machinist work. Similarly, many of my coworkers share the same passions for designing and engineering work, shooting sports, hunting, and outdoor pursuits. When it comes to our firearms, we will not settle for an off the shelf gun, we like to tinker and at times engineer entirely new parts and mechanisms to reach our goals. I write in opposition to HB910 and SB958, a bill that criminalizes the possession of lawfully made firearms, including those owned for the purpose of self-defense in the home. The bill threatens imprisonment for merely owning a firearm that previously was legal with no provisions for compensation for any of the newly criminalized items in this bill despite the financial and time investments made by makers and owners. Maryland residents have always had the right to make their own firearms since before the founding of this nation. Many of the colonial era gunsmiths who made the very arms our nation won independence with were little more than men and women in a shed making their own firearm, much like today's firearm enthusiasts making their own firearms. Beyond this, we have always had the right to share information, something this legislation threatens with prosecution. The restriction of information would be impossible to enforce, costly, and waste valuable police resources to fight an over-hyped threat of home manufactured firearms being used in crimes.

Examining feasibility of making your own firearms

When discussing home made firearms we are often lead to believe there are machines that a person simply pressed a button and out pops a firearm. This could not be further from the truth, the closest to this would be somebody with a dialed in 3D printer that was assembled and tested to output a product within tight tolerances. They would need to print individual parts, sand and file them to fit, assemble this firearm, and test. This is already a tough prospect, as firearms require very tight tolerances to function. 3D printers require quite a bit of testing and calibration, wasting a good amount of material and needing constant tweaks to keep them performing. Onto the materials themselves, unless you have well over $60,000 and an entire room to devote to a metal sintering laser based system (https://all3dp.com/2/how-much-does-a-metal-3d-printer-cost/), you will be using a plastic extruding 3D printer. All of the materials science data regarding plastics will lead you to doubt the effectiveness, longevity, or safety of a plastic gun made by a 3D printer. Not only is the plastic

weak compared to metal, but the way 3D printers work is by melting plastic into thin strings that form layers. Imagine that instead of being one solid piece of plastic, the part is made up of essentially a spiral of material glued together loosely in thin layers, think of it as how soft-serve ice cream is served. While this process may be great for making a chess piece or prototype of a door handle, it doesn't translate well to a firearm that has to withstand extreme pressures (in the case of a 9mm round, up to 35,000 PSI of chamber pressure when the round is fired). This also rules out trying to recreate a production firearm that utilizes plastic parts or a plastic frame. The printed material is simply weaker in every way. Sure it might make for a nice display piece, but you'll never find me firing one.

The much more common way firearms are made at home involve partially finished receivers (often called "80%") where the home machinist needs to perform 20% of the work to create a firearm. This is mandated, regulated, and enforced at the federal level by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (BATFE, or ATF for short). Similarly, how and where these parts can be sold are governed by the Department of State under the International Traffic in Arms Regulations (ITAR). So for a Maryland resident who has done their research and is confident in their machinist skills, they will still need tools to actually complete the machining operations. These can range from a tool chest of hand tools supplemented with a wood router and drill press costing a total of $1,000 (often resulting in a poor result and tens of hours of work to have a functioning firearm receiver), to a full machinist mill costing in upwards of $30,000 on the used market. The home machinist would then complete milling operations for a few hours and if they did everything right, have the first building block of a firearm. Now they will need to purchase supplemental parts such as a trigger, various springs, a barrel, and any number of nuanced parts that must be installed carefully and deliberately to have a functional firearm. There is a steep learning curve here, I know people who have masters degrees in mechanical engineering who shudder at the work involved in manufacturing your own firearm.

Given the extreme cost associated with the tooling required to make a gun, the high cost of actually doing it, and the material weakness, it leaves one wondering if a criminal would go through all of this time, effort, and expense when they could simply buy a stolen black market firearm on a street corner.

The question of costs and why someone would want to make their own gun

Many firearm makers in the state of Maryland have taken to customizing and making their own firearms. Be it for tailoring to individual needs, making an otherwise out of production firearm where costs of an original copy are a tremendous burden, or simply for the pride and satisfaction of making something with your own two hands and the know-how to work with them. Make no mistake, there is value not only in individual parts, but also in the time and effort that goes into the making of the gun. This bill threatens to deprive Maryland residents of property, not only the value of materials but the value of time invested, sometimes many times over in the case of serious collectors.

Cost arguments aside, I have been a firearm owner for a few years now, the clear message I've received from bills like this is one of disdain and animosity toward those with an interest in owning a firearm for self defense, sport shooting, or hunting. This bill is no different, the bill is arbitrarily picking the origin of a firearm and attempting to deprive Maryland residents of their property with no justification and no compensation for their hard work, time, and materials.

The Do-It-Yourself attitudes that have become prevalent in our culture, be it home gardening, working on your own automobile, or even brewing your own fine wine or craft beer, also exist in the firearm community. Many Maryland residents like to tailor the things they use. In the case of a firearm, that thing is used for anything from self defense, hunting, or competition shooting. If the store doesn't provide it or charges unreasonably for it, they may wish to make it themselves. Take for instance, the case of me trying to find just the right grips for a handgun I enjoy shooting. I purchased a very nice CZ-75 handgun from a Maryland gun dealer, went through the MD State Police 77R process, but found when shooting that the grips simply didn't fit my hands or grip very well. Due to the company designing the handgun to fit a diverse base of customers, an active aftermarket exists for grip panels fitting this off the shelf gun. In essence, however, it's a guess and test system for what overpriced piece of plastic will fit your hands the best when it's bolted to the grip of the handgun. As I have a fair background in Computer Aided Design (CAD) and 3D printing, I decided to design and print grip panels for this handgun until I arrived on ones that fit my hand and afforded me the best grip, control, and accuracy with that firearm. Commercial grip panels for this firearm are essentially $50-75 pieces of plastic, imagine having to try three different sets before you find one that fits you.

Lets take another example of why one might want to build their own firearm. In the case of Glock brand handguns, a common complaint is the ergonomics of the grip not fitting most hands very well. One option is to buy the Glock handgun, send it off to a custom gunsmith, wait weeks or even months, and pay in upwards of $1,000 to have a handgun that fits your hand well. Another option is to manufacture your own. In the case of a Polymer 80 handgun frame, the ergonomic enhancements are already there from the factory but you still have to use commercial, off the shelf, Glock brand parts. The frame itself is where you must do the manufacturing yourself. It would be a violation of federal law to manufacture a firearm for another person, after all, so the burden of manufacture is on you, the ultimate owner of the firearm. When all is said and done, a handgun manufactured on a milling machine (often costing upwards of $10,000 for even a used machine) will cost about $650. Cheaper than the custom shop option, but still more expensive than an off the shelf Glock costing approximately $400-500. Once again, the purpose of manufacturing this handgun yourself can be summarized with cost savings, ergonomics, and satisfaction in knowing *you* made the firearm you're depending on.

Information on making guns is readily available on the internet

If you take a moment to scan the QR code on the top of the first page, or visit https://fosscad.org/fc/cad/ , you will find a repository that details the design, engineering, and manufacture of firearms. This information is on the internet forever. This is, however, not the only source of gun blueprints and information. A short amount of time on Google will give you many resources with the required information, even the Library of Congress or Patent and Trademark Office are full of technical data that one could use to manufacture a firearm with little more than expensive machinist equipment, a hunk of metal, and some time and know-how.

Further illustrating this point, I found a technical book complete with blueprints, measurements, assembly, and troubleshooting instructions from a rifle manufacturer in a book store specializing in antique and used books. Aside from the beauty of the illustrations and frankly interesting engineering commentary throughout this book, where I found it may seem unlikely. It was being sold at a book store I frequent on Main street, just a few hundred feet from the very building

you are reading my testimony. In the pursuit of destroying this information, will you send Maryland State Police to book stores to comb through for old patents or technical drawings?

The bill is redundant to federal law

A purely plastic firearm would run afoul of The Untraceable Firearms Act of 1988 (https://www.congress.gov/bill/100th-congress/house-bill/4445), a bill that for over 31 years has mandated at least 3.7 ounces of steel must be present in any firearm so that it can be detected by an x-ray machine or metal detector. No firearm, 3D printed or not, can be legally made without that steel. Even without this steel, if a criminal were truly trying to make an "undetectable" firearm, the metal firing pin, metal springs, and metal ammunition would all show up as telltale signs on a metal detector or x-ray machine.

What does this bill mean to furthering the interest of public safety?

The rationale for this bill is weak, the only people who would comply are those who actively follow developments in Maryland law and have an interest in staying on the right side of the law. Criminals, by definition, do not follow these laws and will continue to ignore them. This law will not hurt criminals, but only those who chose to engineer firearms to meet their specific interests and needs, all while these Maryland residents did painstaking research into state and federal law to ensure they don't violate existing laws.

For these reasons, I must urge you give an unfavorable report to this bill. If it were enacted into law, the State will be prosecuting inevitable violations by otherwise law-abiding citizens of Maryland, destroying reputations and inflicting legal and economic ruin on these individuals, all for continuing to own a firearm that was legal the night before. Jobs will be lost, security clearances revoked, and families broken. Whatever public safety rationale is hollow, as criminals aren't going to invest the time, research, and effort into manufacturing their own firearm when a stolen handgun can be purchased in a back alley of Baltimore. Instead of muzzling the creativity, skill, and curiosity of Maryland residents by taking their property, it would better serve public interest to instead focus on those who have demonstrated a willful disregard for the lives and safety of others, the very people harming innocent people right now.

Sincerely yours,

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