3D FIREARMS ON THE HORIZON

SMALL ARMS AND LIGHT WEAPON SEIZURES

MONTHLY TRENDS IN LATIN AMERICA AND THE CARIBBEAN

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AUGUST 2024

FIU | Jack D. Gordon Institute for Public Policy

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Latin America and the Caribbean is a region with very diverse illegal firearms markets but with an overall trend towards growing demand of weapons by criminal organizations and parastate armed organizations. As such, over the last decade we have seen a considerable shift from acquisition of these firearms via state diversion towards an increasing inflow of firearms coming from foreign markets, mainly the US civilian market, as well as Turkish and Chinese weapons. Yet as demand continues to grow, along with prices for firearms in this market, it was just a matter of time before 3D printed firearms found their niche in Latin America.

Understanding 3D Printing

3D printing, or additive manufacturing, is a groundbreaking process that builds objects layer by layer based on a digital model. This technology has transformed manufacturing, allowing for the creation of intricate and customized parts at relatively low costs and with minimal waste. The process begins with a digital model designed using computer-aided design (CAD) software, which enables precise and complex designs. This model is converted into a Standard Tessellation Language (STL) file, which the 3D printer reads.[1] The STL file is sliced into thin, horizontal layers, and the printer constructs these layers sequentially, creating the final object. This method facilitates the production of complex geometries that traditional manufacturing cannot easily achieve.

Various 3D printing technologies exist, each with unique material deposition methods. For instance, Fused Deposition Modeling (FDM) heats and extrudes thermoplastic filament through a nozzle, depositing material layer by layer. Stereolithography (SLA) uses a laser to cure liquid resin into solid plastic, layer by layer. Selective Laser Sintering (SLS) employs a laser to fuse powdered materials like nylon or metal into solid layers.[2] Binder Jetting deposits a binding agent onto a powder bed to form each layer. After printing, the object often undergoes post-processing, such as removing support structures, sanding, painting, or additional curing to achieve the desired finish and properties.

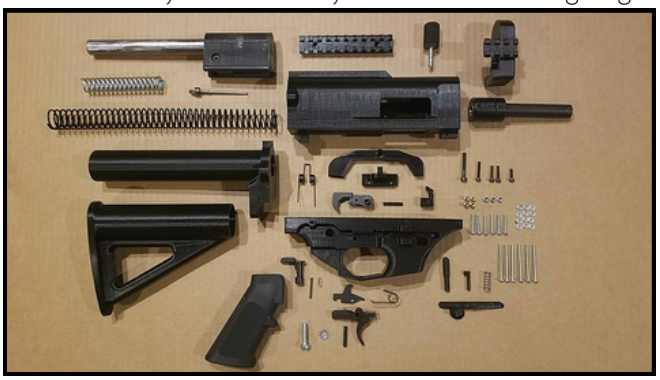
3D Printing and Firearms

In recent years, the United States has seen a surge in 3D printing for firearms manufacturing, primarily due to the ability to create untraceable and unserialized "ghost guns." Unlike commercial firearms, which must have a serial number engraved on the frame, 3D printing allows individuals to produce firearm components without these identifying marks. This capability is exploited by those seeking to bypass background checks and registration requirements. The accessibility of 3D printing technology and the availability of online blueprints have made it relatively easy for individuals to print firearm parts. Websites and forums dedicated to 3D printing enthusiasts often share detailed guides and files for producing these component.

One of the most notable developments in 3D-printed firearms is the FGC-9, which stands for "F**k Gun Control 9mm." This firearm is significant due to its design, accessibility, and effectiveness. The FGC-9 can be made with readily available materials and tools, featuring a 9mm caliber, a common ammunition type. Most of the firearm is constructed from 3D-printed plastic components, with some metal parts sourced from hardware stores or repurposed from other items. The design prioritizes ease of assembly, allowing individuals with basic technical skills to construct the firearm.

Builders often use basic gunsmithing techniques and electrochemical machining (ECM) to complete the FGC-9. ECM employs electrical currents and a conductive solution to remove metal, enabling the creation of rifled barrels and other critical components without specialized industrial equipment. This combination of 3D printing and ECM results in a fully functional firearm lacking any serialized or traceable parts,

making it particularly attractive to those wishing to avoid regulatory scrutiny. The FGC-9 has gained popularity among hobbyists and gun rights advocates and has found its way into conflict zones. For example, various rebel groups in Myanmar have adopted the FGC-9 due to its ease of production and the availability of necessary materials. The ongoing conflict in the region has created a demand for locally and discreetly produced firearms. The use of 3D-printed firearms like the FGC-9 has significant implications for the conflict in Myanmar. It allows rebel groups to arm themselves without relying on traditional arms trafficking networks, which can be risky and expensive, enabling these groups to maintain a steady supply of weapons.



Firearm 3D Printing in Latin America

One of the first cases of 3D printing of firearms or firearms detected by the SALW Dashboard team was in November 2021 in Chile. Chilean customs detected a shipment containing the internals for firearm magazines, and the investigation led to a large seizure of a diversity of firearms including AR-15s, pistols of different kinds, shotguns, and most importantly: several Glock frames that had been 3D printed along with several magazines that were also printed. Interestingly, neither the media nor the authorities mentioned this aspect of the seizure, but our analyst quickly identified the 3D printed parts and even the model that had been used to print. In this case, the purpose of incorporating 3D printed parts was more closely related to the US market characteristics: the suspect detained with the weapons was shipping weapons parts out of the US and into Chile, by purchasing the frames for the Glocks he was not buying regulated and serialized parts, making the process of obtaining these parts from the US market easier. He then proceeded to locally print the regulated part (frame of the pistol) as well as the magazines that tend to have a high price in the regional market.

On March 3, 2023 the SALW Dashboard team recorded their first incident of a seizure of an FGC-9 submachinegun. The weapon was seized in Portoviejo, Ecuador, in the hands of a underaged suspect linked to a murder in San Alejo. Reports made no mention of the nature of the firearms, and only referred to an ongoing investigation trying to link the seized firearm to other incidents.

In February 2024, in the context of an unprecedented security crisis in Ecuador as the government declared war on criminal organizations, authorities conducted operations within a penitentiary installation leading to multiple reported seizures. One of the seizures included 11 pistols and revolvers, a shotgun and "two submachineguns".

The submachineguns were both of non-industrial manufacture as is common in Ecuador, yet one of them was clearly an early model of FGC-9 with a yellow upper, black lower and no stock. While authorities did not specifically identify the weapons as 3D printed, they did highlight the capture of a 3D printer (Ender 3 V2) along with the firearms.

A second report included 14 pistols, a pistol caliber carbine, a shotgun and two submachineguns: one of these appears to be a non-industrially manufactured weapon while the other is an FGC-9.

Later in May 2024, two suspects were arrested in Portoviejo, Ecuador, accused of planning out the assassination of the city´s mayor Javier Pincay. Police seized a 10mm Tanfoglio Witness, two Intratec based firearms (with aluminum casted lowers also frequently seen in Ecuador), and an AR-15 pattern rifle with a 3D printed lower (likely an early Hoffman Tactical design). Once again authorities made no mention of the characteristics of these firearms, yet it is relevant that this is the only location (Portoviejo) in which we have seen two incidents with 3D printed firearms.

In late May 2024, the 41st Rio de Janeiro Military Police Battalion engaged in a shooting with suspects in Beira-Rio community, Rio de Janeiro, and seized what they identified as a "9mm carbine" along with handheld radios and drugs. The image shared by the police allows for a clear identification of another FGC-9 this time in all black material with a stock and appears to be fed with an extended Glock magazine.

The most recent incident identified by SALW Dashboard researchers is also from Rio de Janeiro, when on June 13 members of the 15th Rio de Janeiro Military Police Battalion seized a TEC-9 based submachinegun in Parque Moderno, Duque de Caxias. The gun appears to be built on a TacDaddy based 3D printed lower design but integrating a shorter upper, which might be indicative of yet another development: combining preexisting know-how of building rudimentary open bolt submachineguns with the integration of 3D printed components.

While these incidents do not yet indicate a clear and stable trend, they serve as an early warning of shifts in the regional market and the potential for criminal organizations to meet the expanding demand for firearms. This is particularly relevant if future policies impact the flow of firearms from current providers, making the use of 3D-printed parts or complete weapons a viable alternative. Additionally, 3D printing could also address a niche segment of the market traditionally filled by non-industrially manufactured submachine guns, which offer automatic fire capabilities at an accessible caliber and overall price, despite their questionable reliability and durability.

END NOTES

1. Ngo, T., Kashani, A., Imbalzano, G., Nguyen, K., & Hui, D. (2018). Additive manufacturing (3D printing): A review of materials, methods, applications and challenges. Composites Part B: Engineering. https://doi.org/10.1016/J.COMPOSITESB.2018.02.012
2. Kafle, A., Luis, E., Silwal, R., Pan, H., Shrestha, P., & Bastola, A. (2021). 3D/4D Printing of Polymers: Fused Deposition Modelling (FDM), Selective Laser Sintering (SLS), and Stereolithography (SLA). Polymers, 13. https://doi.org/10.3390/polym13183101.

ABOUT THE AUTHOR

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Dr. Serbin Pont also holds the role of Regional Representative for GPPAC (Global Partnership for the Prevention of Armed Conflict) and is the Adjunct Director of the academic journal Pensamiento Propio. His other commitments include serving as a Senior Fellow at the Jack D. Gordon Institute for Public Policy, a Consulting Member at CARI, a Fellow at the Montreal Institute for Genocide and Human Rights Studies, and a columnist for Perfil.

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