

Technical Aspects of Improvised Firearms – illustrated by two firearms examined at the Forensic Laboratory of the Provincial Police Headquarters in Szczecin

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Abstract:

The aim of the paper is to present two technically advanced home-made firearm designs.

Keywords: improvised firearms, pistol, submachine gun, cartridges.

Among the many different home-made firearms examined by the experts of the Firearms Examination and Ballistics Unit of the Forensic Laboratory of the Provincial Police Headquarters in Szczecin, two deserve particular attention. These are a 9 mm calibre semi-automatic pistol and a 7.62 mm calibre submachine gun. Both were most probably made by the same person, using specialist tools and advanced technological processes. It is difficult to say whether the maker modelled them on any specific existing firearms, but even at first sight the items give the impression of having been made with exceptional care and forethought. The steel machining methods, the fit of the parts and the way the mechanisms interact only confirm this. Some (non-essential) parts,

such as the magazines and grip panels, were adapted from other popular factory-made designs. Examination of both weapons proved them to be fully functional. A further point of interest is that the ammunition for both weapons, extremely different in design, was also made by non-factory means and, during practical examinations involving test-firing of the weapons with their respective ammunition, was fully serviceable and allowed the firearms to function correctly (no technical problems whatsoever, such as stoppages or misfires). Loading, firing of the bullet, ejection of the cartridge case and chambering of the next cartridge – all these stages proceeded properly and predictably.



Fig. 1. Pistol – general view from the left side

Home-made 9 mm Luger (9×19 mm) pistol with a factory-made magazine inserted in the grip (bearing German acceptance marks), intended for the Walther P1 pistol. The magazine design allows it to be loaded with eight 9 mm Luger (9×19 mm) pistol cartridges.



Fig. 2. Pistol – general view from the right side, disassembled into its main parts

The individual parts of the pistol, including the slide ($m \approx 495$ g) and the frame with the barrel ($m \approx 713$ g), show signs of welding and machining (turning, milling, grinding) carried out in workshop conditions using specialist equipment and tools.

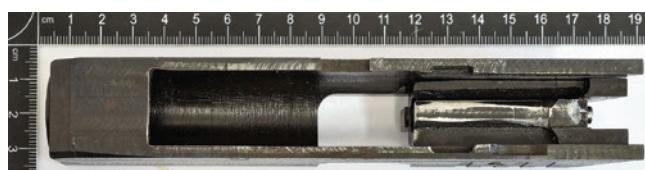


Fig. 3. Pistol – view of the slide from below

A few localised spots of corrosion are visible on the metal parts of the pistol and the magazine. The slide stop lever is located on the left side of the frame. The pistol operates on the blowback principle, the breech being held closed by the inertia of the slide. A home-made wooden grip panel is fitted to the grip. The hammer is made of a light alloy and the other parts of steel.



Fig. 4. Pistol – view of the barrel from the muzzle end

Mounted in the frame is a barrel with right-hand rifling (six lands, each ≈ 1.7 mm wide), approximately 109 mm long, whose chamber is adapted to take 9 mm Luger (9×19 mm) pistol cartridges.



Fig. 5. Pistol ammunition – general view, showing the crimping points securing the bullet in the case

The individual parts of the pistol are properly shaped and interact efficiently, allowing shots to be fired in “SA” (single-action) mode (there is no double-action mechanism) with 9 mm Luger (9×19 mm) pistol cartridges.

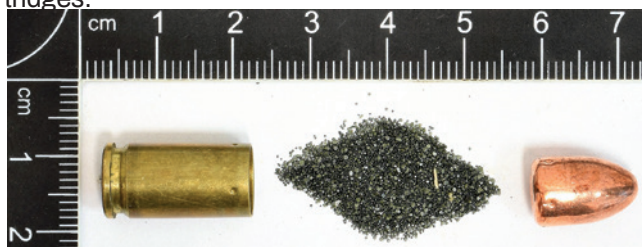


Fig. 6. Pistol ammunition – general view after disassembly (pulling) of a cartridge

Home-made cartridges consisting of factory-made components, i.e. cartridge cases from 9 mm Luger (9×19 mm) pistol cartridges, unfired primers seated in them, propellant (powder) and TFMJ bullets ($m \approx 7.5$ g). Point dents, abrasions and scratches were found on the surfaces of the cartridge cases. Headstamps of various manufacturers are visible on their heads. The cartridges have visible crimping points, made by non-factory means, securing the bullet in the

case. During the examination, some of the cartridges were disassembled to assess their construction (photo). Each of the disassembled cartridges was found to contain approximately 0.24 g of powder charge, consisting of powder of the same type as that in Hilti powder-actuated tool cartridges.



Fig. 7. Submachine gun – general view from the right side

Home-made 7.62 mm submachine gun. The weapon weighs approximately 2,864 g and its overall length (with the stock unfolded) is approximately 73 cm.



Fig. 8. Submachine gun – general view from the left side, disassembled into its main parts

The weapon consists of steel components, i.e. a receiver with the barrel mounted in it (approximately 160 mm long), the trigger and firing mechanism, the fire selector and safety mechanism, the pistol grip, the magazine well with catch, the foregrip mounting arm, the folding stock and the front sight; a rimfire bolt with the firing pin, striker and cocking handle ($m \approx 490$ g); a receiver cover with an aperture sight; a rear abutment with two guide rods and springs (bolt and striker springs); a sleeve with a cross pin; and other components in the form of two plastic grip panels (from a PPS-43 submachine gun) and a wooden foregrip.



Fig. 9. Submachine gun – view of the bolt from its face

The individual parts of the weapon show signs of welding and home-made machining (turning, milling, grinding) carried out in workshop conditions using spe-

cialist equipment and tools. Localised spots of corrosion are visible on the metal parts of the weapon. Mounted in the front part of the receiver is a barrel with right-hand rifling (four lands, each ≈ 2.4 mm wide), whose chamber is adapted to take 7.62×39 mm M43 intermediate cartridges. The bolt has an off-centre firing pin and is not adapted to fire centrefire ammunition. These features indicate that the questioned weapon can be fired only with specially adapted ammunition.

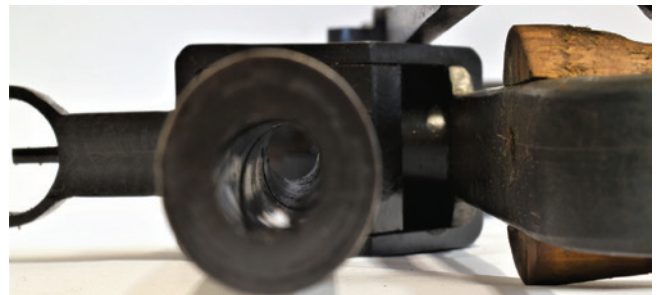


Fig. 10. Submachine gun – view of the barrel from the muzzle end

On the right side of the weapon there is a selector that allows the weapon to be put on safe (selector in the rear position) and the mode of fire to be selected (semi-automatic – in the upper position, or automatic – in the forward position). On the outer surface of the barrel, approximately 15 mm from the muzzle, there are milled recesses on both sides, each approximately 5 mm wide. The aperture sight of the weapon is adjustable for elevation and windage.



Figs. 11, 12. Submachine gun ammunition – view of the external surfaces



Fig. 13. Submachine gun ammunition – view of the external surfaces

The weapon operates on the blowback principle, the breech being held closed by the inertia of the bolt. The magazine well is adapted to take an “AK”-type magazine. The individual parts of the weapon are properly shaped and interact efficiently.



Fig. 14, 15. Submachine gun ammunition – general view and components

Home-made cartridges consisting of factory-made components, i.e. cartridge cases from 7.62 mm M43 intermediate cartridges with drilled-out heads, with 6.8/18 rimfire powder-actuated tool cartridges (manufactured by Sellier & Bellot) placed in the drilled-out head sections and 7.62 mm full metal jacket bullets from intermediate cartridges ($m \approx 8.0$ g) seated in the case necks.



Fig. 16. Submachine gun ammunition – view of the components

Home-made cartridges with 7.62 mm full metal jacket pistol bullets ($m \approx 5.5$ g) and one soft-point bullet ($m \approx 5.5$ g) seated in the case necks. Point dents, abrasions and scratches are visible on the external surfaces of these cartridges.

Summary

The examination of both weapons produced measurement results that were very favourable by the standards of home-made firearms:

- for the home-made 9 mm Luger (9×19 mm) pistol – a muzzle velocity of bullets from the home-made cartridges of 384 m/s to 387 m/s (kinetic energy – 553 J to 562 J respectively). For comparison, the muzzle velocity of bullets from factory-made cartridges was 356 m/s to 363 m/s (kinetic energy – 507 J to 527 J respectively),
- for the home-made 7.62 mm submachine gun – a muzzle velocity of bullets (8.0 g) from the home-made cartridges of 270 m/s to 340 m/s (kinetic energy – 292 J to 462 J respectively) and a muzzle velocity of bullets (5.5 g) from the home-made cartridges of 235 m/s to 332 m/s (kinetic energy – 152 J to 303 J respectively).

The marks left on the cartridge cases and bullets by the relevant parts and mechanisms of the weapons were fully suitable for further comparative examination. It was also found that the two firearm designs discussed here share many features with the improvised firearms discussed in a different and broader context in *Issues of Forensic Science* [1]. The vast majority of home-made firearms examined at the Forensic Laboratory of the Provincial Police Headquarters in Szczecin differ radically from the designs described above – both in terms of the materials and technological processes used and in terms of the end result. Making the improvised firearms described in this article required knowledge of how mechanisms and ammunition work, as well as of technological and chemical processes such as turning, welding, milling and bluing. It should be noted that the barrels with their chambers were made from semi-finished products available on the market [without the relevant permit] – barrel blanks (steel cylinders with a rifled bore). Such semi-finished products also required a great deal of work from the maker – chambers were drilled in them and they were given the appropriate external shape and dimensions. In view of the above, the question may arise: “is it easier to obtain a firearm or to make one oneself?” The author leaves the answer to this question to the readers, after they have analysed the attached photographs – importantly, without taking into account the maker’s motivation.

References

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