



TZ-45

by **Captain Monty Mendenhall**

THE FORGOTTEN SUBMACHINE GUN WITH A SAFETY FIRST

Other Italian manufacturers exist however, including one that manufactured a submachine gun that designed by two brothers, Tony and Zorzoli Giandosio. Made just before the war ended in 1945, the Giandosio brothers' submachine gun was called a TZ-45.

Like the British Sten, the German MP40 and the US M3 Greasegun, the Italian TZ-45 was a second-generation submachine gun. Except for its wooden grip panels, the TZ-45 was made entirely from metal. Like all second-generation submachine guns, it incorporated many time and cost-saving shortcuts in its manufacturing process. The TZ-45 trigger, trigger-housing, barrel shroud and magazine-well are made of stamped sheet metal with the magazine-well welded to the receiver. When compared to even the late-war-manufactured Beretta M38 series of submachine guns, the Giandosio TZ-45 was crudely made. (For more information about the generations of submachine guns, read *Small Arms Review*, Volume 2, Number 1)

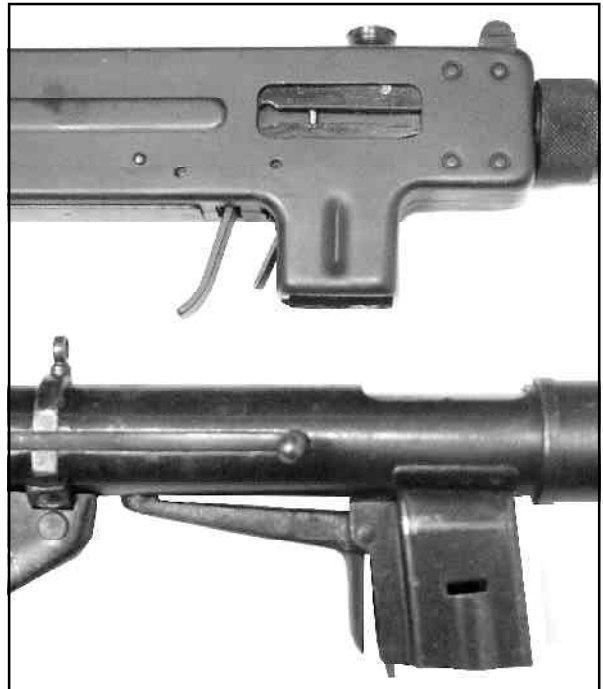
The TZ-45 stock is made of two steel rods that retract and extend very much like a US M3 Greasegun's steel rod stock. When the stock is retracted, the forward ends of the stock rods slip into a guide plate that is welded to the barrel shroud. The guide plate may serve a second purpose as well. If the muzzle and guide-plate

For all of you RKIs, here is a two-part submachine gun trivia question. Name an Italian submachine gun manufacturer of World War Two or earlier? Beretta? Correct. Now name another Italian submachine gun manufacturer of World War Two or earlier? Can't think of another one? If you go way back, you might have answered Officine Di Villar Perosa who manufactured Abiel Revelli's World War One designed submachine gun. Correctly called a Revelli, his submachine gun is better known as a Villar-Perosa.

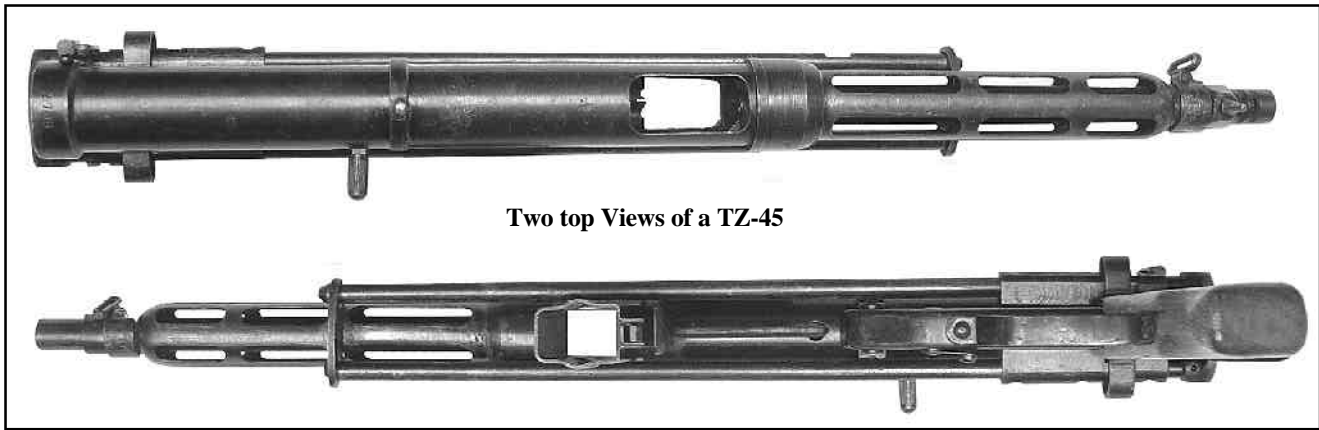
were pushed out of a vehicle's firing port, the guide plate would help to prevent the soldier from accidentally pulling the muzzle back into the vehicle as he fired. The under-barrel hooks of ERMA MP38s and MP40s are said to have been designed for the same purpose.

The TZ-45 had an unnecessarily complicated set of dual-telescoping operating-springs. Otherwise, it was just a conventional open bolt, Advanced Primer Ignition, submachine gun. Its magazine was identical to, and interchangeable with, a Beretta M38 submachine gun series magazine.

The Advanced Primer Ignition principle is quite simple and requires no extra parts. The chamber depth of an advanced ignition open bolt submachine gun is made a few thousands of an inch shorter than the cartridge case's length. This causes the



Right: Top - The grip safety of a Danish Madsen M50. Bottom - An Italian TZ-45 grip safety. The exterior location of the TZ-45's L-shaped grip safety makes it apparent that the shooter's hand grips the shorter arm of the "L." Half of the M50's grip safety is concealed but the shooter grips the longer arm of its "L," thus giving the shooter a mechanical advantage over the grip safety's operating-spring.



Two top Views of a TZ-45

forward moving bolt's fixed firing pin to ignite the primer a moment before the bolt strikes the chamber face. As the recoiling cartridge case begins pushing rearward, it meets the resistance of the still forward moving bolt. The bolt's motion is reversed by the recoiling cartridge case. Part of the energy of the two opposing forces is canceled resulting in both reduced felt recoil and makes the firing cycle seem smoother to the operator.

Advanced ignition also enhances controllability by reducing the submachine gun's muzzle-climb. The heavy telescoping bolt's center of mass is forward of the submachine gun's center of gravity at the point of cartridge ignition. The telescoping bolt's inertial action pushes the submachine gun's muzzle forward and down, thereby reducing felt recoil and countering the recoiling cartridge's attempt to make the muzzle rise.

Finally, the inertia of an advanced ignition submachine gun's forward moving bolt must be overcome by the recoiling cartridge case. This allows the weight of the bolt to be reduced, decreasing the submachine gun's weight.

Advanced Primer Ignition allows an open-bolt submachine gun to be both lighter and more controllable.

A Better Safety is Needed

Except for one innovation, there was nothing remarkable about the TZ-45. It did incorporate one new feature that made the TZ-45 unique and assured its place in fire-arms history books. The Giandoso brothers' submachine gun was the first to have an automatic grip safety.

All previous submachine guns had manual safeties of some sort. If the user failed to engage them, the weapon could

be fired unintentionally. Unlike a manual safety, the TZ-45 grip safety was always engaged unless the user squeezed it while firing. This safety locked the bolt in both the forward and retracted positions, thus making the TZ-45 safe to carry with a loaded magazine inserted into its magazine-well.

Introducing an automatically applied grip safety requires much thought. Not only must its application be automatic, but its disengagement must be automatic as well. The concept and execution of a safety of this type was not new in 1945. Some early model P.08 Luger pistols have an automatic grip safety, as do all models of the 1911 Colt pistol. When a soldier removed his hand from either the pistols' grip, the safety was automatically applied. Regripping the pistol automatically disengaged the automatic safety. These pistols also had a manual lever safety that could be applied to make them SAFE at all times.

More than thirty years elapsed before the Giandoso brothers applied the automatic grip safety concept to a submachine gun. Instead of copying the P.08 or 1911 Colt grip safety, the Giandoso brothers took a simpler route and placed their automatic bolt locking safety on the rear side of the magazine-well. The intention was for the soldier's left hand to squeeze the grip safety while the right hand pulled the trigger.

Though the automatic grip safety's magazine-well location made it simpler for the safety to engage and lock the bolt, the TZ-45 grip safety was less than ideal. Obviously, the TZ-45 could not be fired with just one hand. Less obvious but perhaps more important, the soldier's left hand pressed against the shorter arm of the L-shaped grip safety. This gave him less mechanical advantage to overcome the grip safety's operating spring. Unless the soldier made a conscious effort to squeeze

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the grip safety firmly, the longer arm of the L-shaped grip safety would rub against the bolt as it cycled. This slowed the bolt's speed and caused occasional misfires.

The Danish Madsen M50 submachine gun had a similar type of grip safety but the arms of its L-shaped grip were reversed. The soldier gripped the longer arm of the M50's "L." giving him a mechanical advantage over the spring. The M50's grip safety was better designed than the TZ-45's but it was still less than ideal. Like the TZ-45, the M50 could not be fired with just one hand.

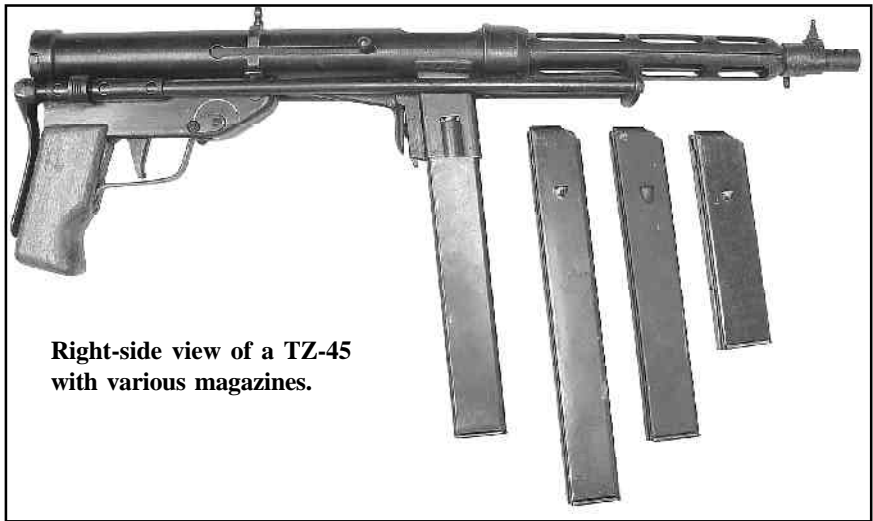
Shortly after World War Two ended, the first submachine gun to have a grip safety that was operated by the shooting hand was the Czechoslovakian ZK476, though few were manufactured. The Israeli Uzi was the first submachine gun to have a safety of this type that saw large-scale production.

A Needless Complication

The bolt diameters of a Beretta M38 and a TZ-45 are nearly identical. This made it possible to remove the TZ-45's dual operating spring mechanism and substitute the Beretta's simpler inside receiver-wall fitting, large diameter-coil, operating spring. With its original dual operating spring, the TZ-45 cycled at 810 rounds per minute (rpm). With the large diameter Beretta operating spring, it cycled at 816 rpm. This brief experiment indicated that the TZ-45's complicated telescoping dual operating spring mechanism was unnecessary. A simpler, less expensive, receiver-wall fitting large-diameter operating spring would have functioned just as well.

Safety & Fire Control Selector

The TZ-45's 810 rpm full-auto cyclic rate is too fast to allow even an experienced shooter to pull and release the trigger quickly enough to fire a single round. For this reason, there is a combination manual lever safety/fire control selector located on the right side of the trigger-housing. When the lever points rearward, the manual safety is applied. If single rounds are desired, the lever is placed at the sixty-degree position. When rotated 180-degrees forward, full-auto is selected.



Right-side view of a TZ-45 with various magazines.

Production

Approximately six thousand TZ-45s were manufactured in Italy during the final months of World War Two. During the early 1950s, the TZ-45 production rights, patterns and machine tools were sold to the government of Burma. It has been reported that the Giandosos went to Burma to supervise the Burmese manufacturing of their submachine gun. Designated the "BA-52, only a small number of

the Burmese manufactured Giandosos submachine gun were produced and none are known to be in the US.

Field Stripping

Assure that the TZ-45 is unloaded and that the fire control selector is set to full-auto. The next disassembly step is unlike that of any other second generation submachine gun. Remove the two screws that secure the trigger housing to the receiver.

Caliber	9x19mm Parabellum
Operation	Open bolt, unlocked breech advanced ignition, semi and full-auto,
Cyclic Rate	550 to 600 rounds per minute
Muzzle Velocity	Federal 115g ball, 1219 fps Hirtenberger "Machine Gun Only," 1449 fps.
Weight (Empty)	7.1 lbs. (3.2kg)
Length stock retracted stock extended	21.75 inches (552 mm) 33.25 inches (845 mm)
Barrel Length	10.0 inches (254 mm)
Magazine	Beretta two-column left-right feed box magazines of 10, 20 32 & 40- rounds
Sights	Non-adjustable aperture rear sight and spherical post front sight

(That step alone should have eliminated the TZ-45 from further consideration by most armies.) Next, depress the receiver endcap-detent button, located in the center of the endcap, and slide the trigger housing downward. While accomplishing this, position the left hand behind the endcap to capture the dual operating springs as they are under tension and will fly out if care is not taken.

Pull the bolt to the rear end of the cocking-handle slot. Remove the cocking handle by pulling it straight out. After its removal, the bolt will slide freely out of the receiver. The barrel cannot be removed without the use of a dedicated spanner wrench.

Reassembly is in reverse order. Remember to pull the trigger while reinstalling the bolt so that it can move forward past the trigger-sear.

Shooting the TZ-45

Like all Beretta-type magazines, the TZ-45 magazine loads easily and no magazine loading tool is required. In preparation for firing, place the manual lever safety to the rearmost, SAFE, position.



Above: Top to bottom - Beretta M38a, Giandoso TZ-45, Madsen M50 and an Uzi. The Beretta is a first generation Submachine gun. The TZ-45 and the M50 are second generation. Both have grip safeties that are deactivated by the non-shooting hand. The Uzi is a third generation submachine gun. Its grip safety is deactivated by the shooting hand.

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Pull the telescoping stock rearward where it will automatically lock in the fully extended position. To retract the stock, simultaneously squeeze both stock locking buttons and push the stock forward. Squeeze the grip safety with the left hand and retract the bolt with the right.

When ready to fire, insert a magazine and move the manual safety to select either FULL-AUTO or SEMIAUTOMATIC. Firmly squeeze the grip safety while pulling the trigger. The sights are regulated for 100 meters (109 yards). Due to the relatively flat trajectory of the 9x19mm bullet, a

center-of-mass aim will hit all but the smallest targets from the muzzle to 120 meters (131 yards).

Summary

Other than being faster to manufacture and less expensive than the Beretta M38 series of submachine guns, the Giandoso brothers' submachine gun had little to recommend it. Though it was the first submachine gun to have a grip safety, the TZ-45 safety was not well designed. Not only was it operated by the non-shooting hand, but the shooter's hand bore against the L-shaped grip-safety's shorter arm. A very deliberate effort was required to disengage it. If it was not firmly held, the grip safety would drag on the bolt and cause malfunctions. Though a properly designed grip safety is an asset for a submachine gun, the TZ-45's proved to be a liability.

In spite of its noted shortcomings, the Giandoso Brothers' TZ-45 was a landmark in submachine gun development. It represents a true "first." No matter its other defects, the place of the TZ-45 is assured in history.

