PART II

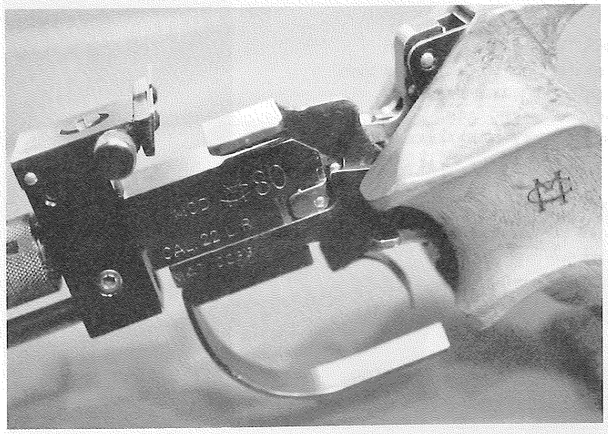
FREE THINKING ABOUT THE FREE PISTOL

IN PART ONE, WE REVIEWED THE HISTORY AND PAST DEVELOPMENT OF THE FREE PISTOL, WHICH WE CALL THE FREE IN THIS SERIES, AS WELL AS SOME IDEAS AND VISIONS FOR ITS FUTURE DEVELOPMENT. NOW, LET'S TAKE A CLOSER LOOK AT THREE MODELS THAT DEVIATE FROM THE NORM IN THE TECHNICAL DEVELOPMENT OF THESE GUNS WITH THEIR SPECIAL INVENTIONS.

CM 80 SUPER

This model of the free, which the Morini firm offered for the first time about ten years ago, is striking at first sight. Its overall length of 520mm is 100mm longer than most other frees, since its line of sight has been moved forward. The barrel is not 100mm longer but has a customary length of 250mm. A tube screwed onto the muzzle carries the front-sight bead on the front end of the pistol. The rear-sight notch is also not in its usual place, slightly above the thumb's joint, but almost 200mm in front of it, above the beginning of the barrel.

At first glance, you would definitely rate the CM 80 as a premium sports car among frees, almost a Rolls Royce – or a hand-carved substitute. Afterwards, you should examine the technical principles used in its design and what advantages or even disadvantages can be expected of them.



The distinguishing feature of the Morini CM 80: the notch is in front of the trigger and breech, instead of behind it, above the grip.

When you look through the notch, which is 200mm further away from the eye, and the bead, the sighting picture appears much sharper. Whether this has a positive or negative effect on performance depends on the shooter. In text books, you can read that the unavoidable unrest (in the sighting picture) should not be too sharp. If the notch were way in back, as usual, over the thumb's joint, the line of sight between the notch and bead sights would be far too long and would therefore make the sighting picture too sharp, whereby you would be apt to aim too long and hesitate before shooting.

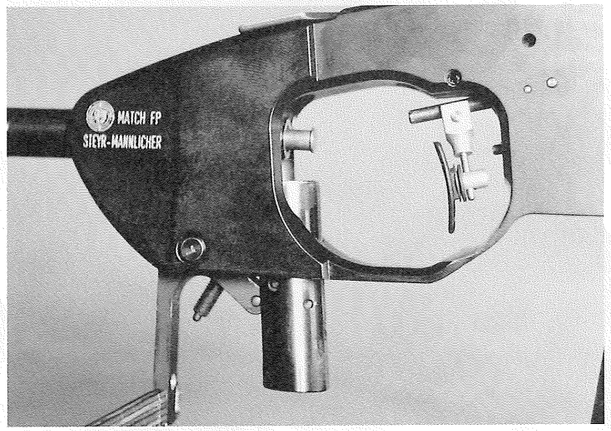
The forward-shifted line of sight also has an impact on physical unrest. If an oscillating movement emanates from the shooter's body, which is generally the case, the distance of the notch and bead sights from the body is insignificant. The purely theoretical oscillation around the pivot point at the grip, caused by a very unsteady wrist, produces the same bad shots with a CM 80, whose line of sight between notch and bead is far in front of the grip, as with any other free, whose line of sight is above or even behind the grip. The greater overall length strains the shooter's wrist and condition more than most customary frees. Additional weights above or below the barrel are therefore hardly necessary. Although the added strain is not relevant, it is an indication that the CM 80 is better suited for elite shooters than untrained beginners. That's why it's not widely used but has developed into an obscure, almost rare specialty item.

The manufacturing firm – whose name every shooter immediately associates with its owner, Cesare Morini, former elite shooter, trainer and technician who equips the frees and sport pistols of several firms with the popular "Morini grip" – later designed its successor, the CM 84 E, with the customary appearance and electronic trigger familiar to us from other frees. This model has become very popular and is presently among the most widely used frees.

STEYR FP

This free, which has stimulated the market since 1995, arouses interest and curiosity at first glance. Is the barrel mounted incorrectly? No, it is situated 30mm lower than the barrels of all other frees and is therefore directly in front of the wrist instead of above the uppermost edge of the wrist. The reason for its lower position is well known to all shooters. The blow back of every gun causes the entire gun to move backwards a short distance as a compensation for the forward course of the bullet, and if the barrel is situated higher than the wrist, which serves as a pivot point for customary frees, the pistol will jump up several degrees. But since the barrel of the Steyr FP is directly in front of the pivot point, it does not jump up or hardly does. The fact that the line of sight is designed 40mm above the barrel does not play a part in irregular canting, contrary to prevalent opinion.
Due to the large distance of the cartridge chamber and firing pin from the trigger, all these are connected with each other by three intermediary components that conduct the shot-release movement backwards, upwards, forwards and downwards. This sounds complicated but produces the same shot-development times as the other frees – several milliseconds.

Each free is equipped with a lever which is used to unload an empty shell and to load the next cartridge. It is attached at different places on the individual models: on the left or right side of the barrel, below the grip, up front under the trigger on the FP. And apart from its function as a loading lever, it can also be used for minor corrections and the safe storage of the gun.



The Steyr FP also transfers the shot command of the index finger from the trigger to the cartridge in milliseconds, even if around corners.

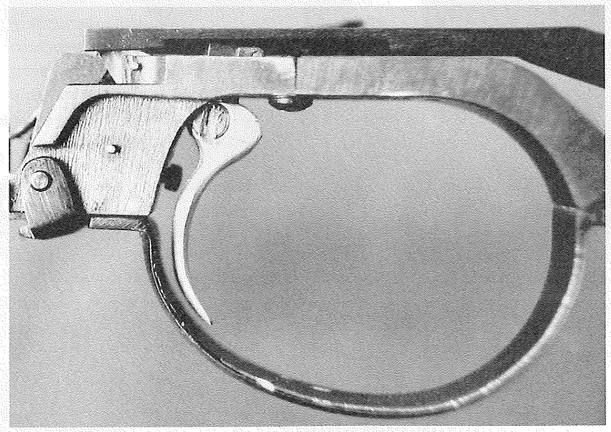
While loading or unloading, a cartridge or a shell may fall into an empty space beneath the cartridge chamber which is unavoidable due to the gun's construction. It is not possible to simply shake it out, since the piece of ammunition would have to fall around a corner. The loading lever and connected locking cylinder, onto which the piece of ammunition lands in the empty space, can be quickly removed in matter of seconds. Just press out the shaft – which holds the cartridge in the desired position and which is only held in place itself through the tension of the spring – to the left or right side with your fingertip or another cartridge, and the gun components and piece of ammunition will fall out. The components and the shaft can be inserted again, just as quickly, in a matter of seconds. This simple and very fast means of removing and attaching the loading lever and locking cylinder also enables safe storage and transportation. The reason why this interesting free has not become popular worldwide and, at most, is only as widely used as several other modern frees is that a great advantage can also be a disadvantage. The low lying barrel forms an extension of the arm and thus prevents the barrel from jumping up. If the grip of the FP is held properly and flawlessly, it will function better than any other free whose upward jump means an additional movement which can give rise to differences and thus cause mistakes. No shooter, however, can hold the grip perfectly and flawlessly on every shot. False pressure applied to the grip by the hand, regardless of how much or in which direction, is partially cushioned and reduced in the other frees through an upward jump. With the FP, the impact of this mistake is stronger. A shot, which you know cannot be a ten, even before you look at the monitor or through a field-glass, will more likely turn out to be an eight rather than the usual nine. This interesting free, which has surpassed all technical barriers, tends to function less well than the customary frees, when manual errors are made, but better when eyesight or shooting-stance errors are made.

TOZ 35

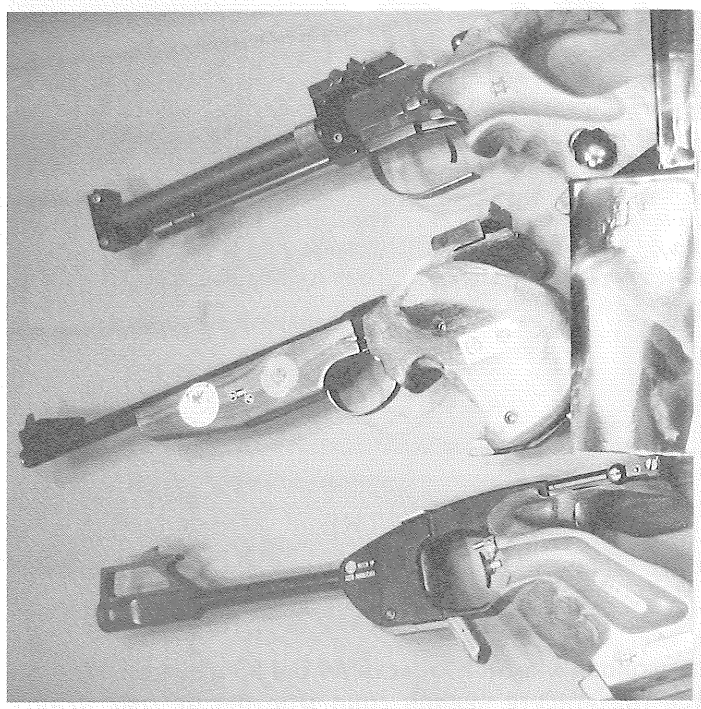
General sport statistics show that shooters use a variety of different models developed within the past ten years at international competitions. They also show that older, time-tested frees are in use. But the fact that one such model has dominated the market for four decades is reason enough for us to take a closer look at it.

Around 1962, the Russian shooter, Efim Chaidurow, wrote his thesis on the free and designed one for his graduate work, thus paving the way for the triumphant march of the TOZ 35. As mentioned before, more shooters use the Toz 35 than any other free and therefore win more medals with it. Nearly all Toz shooters have tried other frees but nevertheless have decided to use this oldest model, after a neutral assessment, for the following reasons, including two special reasons:

- there are no obvious differences in the precision or length of the barrel and no differences in the sight; the form and adjustability of the grip can be adapted to individual wish on all models; the pistol weight is also adjustable, with or without additional weights. The relatively low price of the Toz is only an additional advantage but not a decisive factor. The two main advantages do not come to light on the very first trial shot but only after several shots or several hours of training:
- the Toz moves less when a shot is fired – regardless of whether faster or slower ammunition is used or no ammunition is used during



The secret of the Toz is concealed behind the trigger and above it: the jolt-free shot release and rotating trigger.



The most reliable free pistol is still: Toz (middle) ahead of Steyr (left) and Morini (right: here with a backward shifted sight, creating a shorter line of sight) and all other models.

dry training – whereas the unavoidable movement of the trigger and breech components is perceived more strongly, if only for fractions of a second, than with other frees; electronic trigger (see later); the result of this mechanical factor is that shots with the Toz tend to be better than expected;

• the trigger is so adjustable that it can not only be pulled straight back but also at an angle to the side.

If these technical advantages are so easy to recognize, then they should also be just as easy to explain. The CAM manufacturing technique (CAM = computer aided manufacturing instead of gun-smith work with a file), which has developed tremendously since the 1960s, is not used at all for the Toz. Although this model is partially manufactured by machine, the individual components and springs of the trigger and breech are still made the same way they were back then. If you disassemble the Toz and another model so that their components can be compared, you will immediately see that the Toz has laminated springs (slender, long metal springs that are nearly paper-thin) and many tiny individual pieces (six intermediary pieces that move between the trigger and firing pin when a shot is fired and a relatively long lever), whereas other frees have spiral springs and several large individual pieces (three for example in the Steyr FP). And that's it. From a perfect vantage point, that is to say if these components, theoretically speaking, were placed on a straight line, you would see that the spiral spring is much longer than the laminated spring and therefore has a stronger vibration, when the trigger action activates the firing pin, which is transmitted to the entire pistol. During this process, each of the intermediary pieces hits the one next to it, and several large pieces naturally transmit a harder blow to the entire pistol (than many small pieces) because of their greater mass.

Yes, but if all that's true, why isn't this principle applied in practice today?

The tiny intermediary pieces and specially formed springs are easy to manufacture and process by hand and also by machine, if personally controlled, but this would be too complicated and costly for a computer. The match rifles are an example of the opposite contemporary development. Whether it's the pressurized air system of the air rifles, the aluminum stock or the multiple adjustability, all modern production is done by CAM. A perfect Toz trigger would not be adjustable enough for rifles, but that's not at all necessary, since the much heavier rifles safely absorb the brief blow of the trigger and breech components. Actually, the only possible enhancement or improvement, compared to the Toz trigger, is the electronic trigger. And the CM 84 E by Morini is relatively popular, since it has definitely overcome the diverse technical problems of other electronic triggers.

What is the purpose of the second Toz secret which is a trigger that can be pressed sideways?

In text books, you read time and again that the trigger finger must definitely pull the trigger straight backwards. Since the triggers of all other frees can only move in that direction, due to their construction, even a very minor, lateral force or movement of the trigger finger, usually back to the left, would press the trigger, the entire pistol and thus the shot to the side, causing a tear. The human anatomy contradicts the mechanical and technical demands of a gun which the following experiment demonstrates: Hold a free, preferably with no trigger, or another round object before your eyes and bend your trigger finger in the direction of your thumb, like you would when you fire a shot. If you practice this action several times – unconsciously, suddenly and slowly – you will notice that the fingertip you use to pull the trigger bends around the central and anterior joints or around the posterior joint. And it definitely moves several degrees to the left around the latter-mentioned joint, that serves as a pivot point, causing any trigger, that is adjusted to move straight backwards, to be pressed in that direction and thus to shoot in that direction. To make sure the trigger finger always performs the same movement around the anterior joints – and by no means around the posterior joint – intensive training is required. However, this movement can still cause a mistake. The Toz trigger is adjusted in such a way that the trigger can be pressed somewhat to the left, when a shot is fired, and thus eliminate the source of this mistake.

No other modern frees come equipped with a laterally adjustable trigger like Toz for the same reason that additional components of the trigger and breech are not produced. It is simply too complicated for the computer aided system, CAM, to manufacture these parts of the Toz trigger.

The Toz 35 free pistol is quite justly called the queen of the royal discipline and will most likely not have to yield this title to a newer and younger model for quite some time.

Hannes Rainer

PROFILE

Hannes Rainer | AUT

A Life Dedicated to the Shooting Sport

Hannes Rainer first completed a vocational training program as a gunsmith and later a professional training program with the police to deactivate bombs. Back then he was introduced to the shooting sport by his superiors. He quickly experienced success and today can look back at a remarkable collection of 50 national medals, seven of which are gold, plus three medals from European police championships and one medal from a world championship in 1982. A special highlight of his athletic career was his participation in the 1980 Olympics in Moscow.