

ISSF Coach Course

CLAY TARGET

Movement to the target



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ISSF Coach Course

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1. INTRODUCTION

The movement towards the target is the core of the technical gesture in clay target shooting disciplines, performed after having achieved a proper ready position. In this course all the phases involved in this action are described with a scientific approach taking into account biomechanical and ballistic concepts and through the description of the basic aspects of some of the human body's systems such as respiratory and visual.

How to decide which type of call to use? How to determine when to start the movement and how to perform it? By studying the features of the breathing action and the visual system, knowing the strengths and weaknesses of each specific use of them, the coach can decide which type of call to choose, moreover, he can determine the initial movement towards the target, for which the morphological features of the shooter and the application of the concepts of biomechanics to guarantee balance and stability until the end of the technical gesture are also considered.

How to drive the shotgun during the transition phase towards the target? What should be considered in order to find a correct sight picture? And above all, how to perform the shooting action? And the one right after the shot? Such a quick movement needs to be analysed in every phase, describing in detail what is happening so as to be fully aware of what needs to be done to achieve a positive result.

Finally, the different shooting styles will be described in order to highlight the pros and cons of each one and to allow the coach to choose which style to adopt.

2. CALL OF THE TARGET

In both disciplines, the call of the target is made by the shooter after completing the preparation phase, during which he/she is in waiting position. The type of call can have a positive or negative influence on the shooting action, in particular attention must be paid to several features: length, tone and intensity, as well as assessing the distance of the shooter from the



microphone. Before proceeding with the analysis and definition of a correct call, it is right to be aware of the features of the microphones found on the shooting fields: they can be considered as the connection between the target thrower machine and the shooter, equipped with a type of electromechanical release and with a sound filter inside to prevent unintentional release of the target caused by the wind or other external sounds; moreover, it is set a minimum level below which the target is not released. The act of calling marks the end of the preparatory phase, determining the actual beginning of the shooting action. Examining the two disciplines, it is possible to notice some differences in the way the shooter should make the call:

- In the Trap discipline, the voice must be short and firm, moreover, depending on the shooter mouth positioning on the stock, it is advisable to adapt the call in order to avoid head movements and excessive activation of the oculocephalogyric reflex: if, for example, you are dealing with an athlete who keeps his mouth open on the stock, you must opt for the use of the vowel 'A' in the call, while with the mouth closed in the waiting position, it is recommended to use the vowel 'O'. This little trick allows the shooter to make the call

without having to change his position, thus remaining ready to decide when to start moving towards the target;

- In the Skeet discipline the call must be slightly longer than in the Trap, to allow the shooter to reduce the wait due to the timing in the release of the target by the thrower machine, which varies from 0 to 3 seconds from the time of voice input. In any case, the call must be made in a firm manner, both to motivate the shooter and to allow the microphone to clearly and immediately detect the sound.

In both disciplines, the main purpose of the call is to allow the shooter to hold a stable waiting position and avoid any type of muscular tension that could cause swings such as to compromise the starting movement towards the target and therefore making the execution of the technical gesture more complex.

BREATHING: GENERAL PRINCIPLES

When the shooter makes the call of the target he/she produces a sound which, as seen before, must have certain features: the sound is produced through the emission of air, hence it is necessary for the athlete to know which is the best way to channel the air and use it in the best way for his/her purpose. In order to be able to understand which is the most suitable solution, it is necessary to focus on breathing, an action as common (one person takes an average of twenty thousand breaths a day) as underestimated and untreated.



Photo by doctorum-hamburg.de

Generally, a good breathing can be divided into 3 sections, from bottom to top, in the following way:

- Low or abdominal or diaphragmatic breathing: this is the lowest section and is the one in which the greatest amount of air is taken. The diaphragm is located in this area, which is the most important organ in the respiratory act. A correct use of the diaphragm, in fact, brings several benefits to the person and, in our specific case, to the shooter aimed at performing the best technical gesture. It is filled first and emptied last;
- Intermediate or thoracic breathing: this is the intermediate section, in terms of position and function, in which a little less air is taken in with respect to the lower section;
- High or clavicular breathing: this is the highest section and is the one with rather less space, where the 'details' of the breath are managed. It is filled last and emptied first.

We can easily guess that in order to perform a complete breathing, which brings the greatest benefits, one cannot do without practising diaphragmatic breathing allowing each person to fill the various sections described and, above all, thanks to the control of the diaphragm, to manage consciously both inhalation and exhalation. With a proper diaphragmatic breathing, the stomach



Photo by manuelcasadei.com

must be partially inflated so that the diaphragm is pushed down and a large amount of air can be taken in; it should be pointed out that, like all muscles, the diaphragm is strengthened by working against resistance, so if the abdominal wall weakens then the diaphragm in turn weakens as well and the consequence is that less air enters the lungs, while the remaining volume increases, so that to obtain the same amount of air you will have to breathe more frequently, with short and superficial breaths. For this reason, it is

recommended to strengthen the abdominal muscles, which, among other things, allows the shooter to obtain considerable benefits in maintaining the correct posture.

Sometimes, when you are under pressure or you want to sing or produce a sound as when a shooter has to make the call, you may experience a superficial breathing, sometimes accompanied by a shoulder lift, which fills only the upper or clavicular area with air, with the consequence of having less air in your lungs, but above all more problems in having control over the air emission, which occurs in a more uncomfortable way.

HOW TO MAKE THE CORRECT CALL

Given the above, it is possible to establish that the best way to make a call with the specifications seen at the beginning of this chapter is through the use of diaphragmatic breathing. In fact, by doing so, the shooter can channel the necessary amount of air to emit the call sound through the correct use of the diaphragm, which will allow him/her to have better stability in posture and, consequently, the ability to stay still until he perceives the target. In addition, this type of breathing allows the shooter to better manage stressful situations, thanks to a higher oxygenation of the blood and brain. On the contrary, with a superficial breathing, the shooter will find it difficult to emit a clean sound that does not affect his stability, with the risk of anticipating the beginning of the movement on the call itself or doing it late because of the extreme tension.

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Self evaluation

1. Define how the call should be made in both the Trap and Skeet

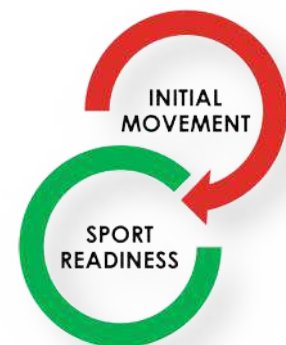
2. Recapitulate how a good breathing is meant to be, explaining which type of breathing provides the best benefits and why

3. INITIAL MOVEMENT TO THE TARGET

The moment when the shooter starts the technical gesture is the crucial time for the success of the whole movement towards the target. Being able to decide when and how to move the shotgun in the direction of the target allows the athlete to be in the best possible conditions to achieve the breaking of the target. It is advisable to remember two important aspects that are determined during the preparatory phase of the waiting position, i.e. gun hold position and eye hold position, which are fundamental for a good reading of the target and to have ease and control over the movement as soon as it starts. In detail, the positioning of the eyes is important to identify the perceptive area (field of vision) of the athlete, within which both the exit area of the target and the tip of the gun barrels must be located, but even more important is the way in which the shooter uses the visual system to receive information and leads the shotgun towards the target.


SPORT READINESS


The expression Sport Readiness refers to the body's ability to meet the necessary requirements for a given sport or activity. The development of a good Sport Readiness is fundamental in the initial movement phase as it allows you to have mental




clarity in deciding the exact moment when to start the technical gesture and the readiness to perform it immediately.

This peculiar ability is trainable and is closely related to specific aspects, such as emotional state, functional state and perceptive ability:

 The emotional state is highly subjective and is intended as a reaction to a stimulus able to condition the subsequent behaviour. It can be influenced by the determination to achieve a result, clarity in goals and both external and internal factors, such as the result in the previous competition, expectations, stakeholders, fears and influences;

 The functional state defines the state in which the athlete is in relation to the actions to be performed for the execution of a given activity. It is characterised by the athlete's physical state (tiredness, hypertonicity, difficulty in breathing, dry eyes, etc.), the nutrition, which can be correct or wrong (e.g. fried food before the competition, sweets before the series) and which can influence the glycemic index, which must be kept constant and above a certain level during the performance. The functional state is also conditioned by the presence of any allergies and/or illnesses in progress and by the level of both athletic and technical preparation of the shooter;

 The perceptive ability allows the shooter to acquire, through the information recorded by the visual system, all the useful and necessary information to manage the sequence of the different phases of the technical gesture:

- ❖ awareness of the position of the gun barrels;
- ❖ possible movement and change of position during the call;
- ❖ reading the flight path of the target;
- ❖ separating the main target from the background in a short time;

- ❖ finding the correct position of the gun barrels with respect to the target's trajectory during the execution of the movement.

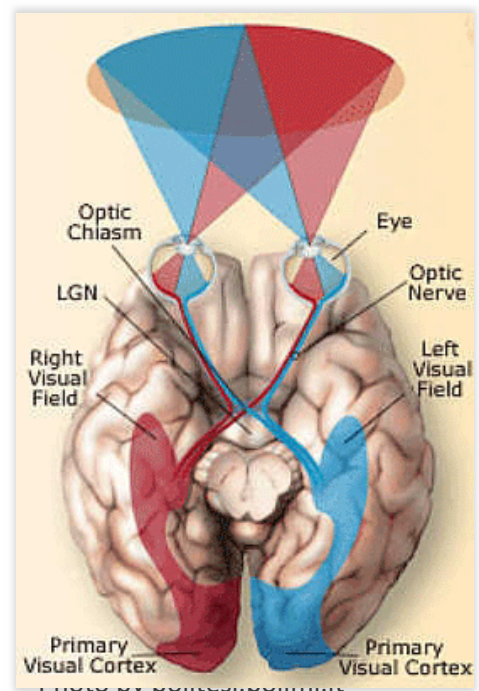
TARGET PERCEPTION: THE VISUAL SYSTEM



Photo by otticapassuello.it

In both disciplines the shooter on the platform must interpret the information relating to the flight path of the outgoing target and organise a motor response in the shortest time and in the most

accurate manner possible. It is necessary at this point to focus our attention on the fundamental aspect characterising the reading of the target information: perception through the visual system. Going into depth into the knowledge of the visual system and its interactions will provide new tools to be integrated into the daily training by developing more and more refined working methods in search of performance optimization at all levels, from the start-up to the refinement. One of the first fundamental differences to be considered is that between SIGHT and VISION. Sight is an innate sense, namely the ability to recognise a light stimulus and receive information from it. It is assessed with visual acuity (10/10, 20/20 depending on the measurement system used) and is evaluated as the ability to recognize a symbol or a letter of a certain size placed at a certain distance. Vision is a function that is acquired during the motor and sensory development phases. It includes a set of skills that, through a synergic and coordinated interaction of the two eyes, allow us to learn information from the surrounding environment. The information detected by the visual



system, integrated with the information perceived by the other senses, is processed by the intermediate stations of the brain and the cerebral cortex allowing us to organise a response which enables us to interact with the outside world. The fundamental feature of vision is its evolutionary nature, which makes it malleable, educable and improvable; this means that through visual training programmes we can enhance it according to our needs and refine it according to our requirements. "Seeing" is an action that may seem simple, but organising the visual system to perceive a target and organise a rapid and precise motor response is instead an extremely complex activity. The anatomo-functional architecture of the visual system, in fact, is highly interlinked and is held by the retina to the cortical areas with extreme precision. This organisational system allows the brain to acquire the greatest source of information necessary for space orientation and therefore for the capture of targets of interest.

A large part (over 60%) of the brain activity is connected to the processing of the visual signal. Extensive cortical areas, from occipital to frontal and subcortical regions, are involved in visual processes ranging from the perception of the sensory signal to its subsequent processing and integration for the programming of motor responses or for the acquisition of complex cognitive experiences. It is a common mistake, especially in sports, to consider the visual system as only an

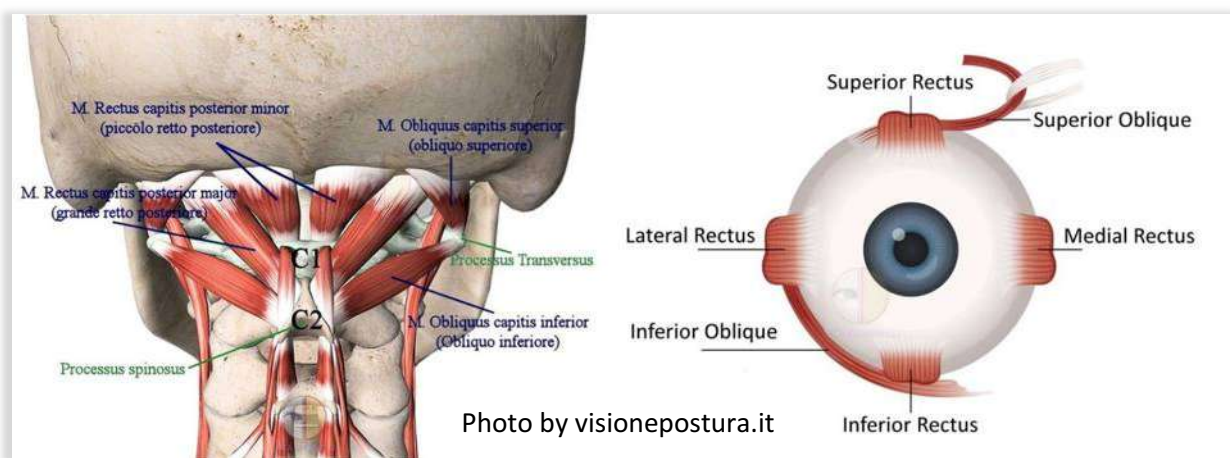


Photo by magazine.veyes.it.it

exteroceptive organ, closely connected to the central nervous system, which provides the brain with information captured in the external space for the management of motor responses and the management of balance and posture through the retinal system and visual abilities. The visual system also has an important proprioceptive function aimed at informing the CNS about the

position, direction and acceleration of the body and in particular of the head in space. The first information is collected by oculogyria which is the mobility within the ocular globes and it was proved, in fact, that the oculomotor extrinsic muscles are equipped with neuromuscular spindles communicating to the cerebellum the position of the eyes inside the bulb even with closed eyes. Oculogyria is in very close anatomical and physiological connection with the vestibular system, the neck muscles and the shoulder muscles. The neurophysiological link between oculogyria, vestibular system and cervical proprioception is called oculocephalic reflex (OCR).

The visual system delivers the first message to the structures responsible for balance and posture control and closely operates with the vestibular system and the somatosensory system. By integrating visual, vestibular and somatosensory information, the nervous system manages proprioception at all levels, also known as kinesthesia, i.e. the ability of recognizing the position of the body in space and the state of contraction of the muscles even without the use of vision.



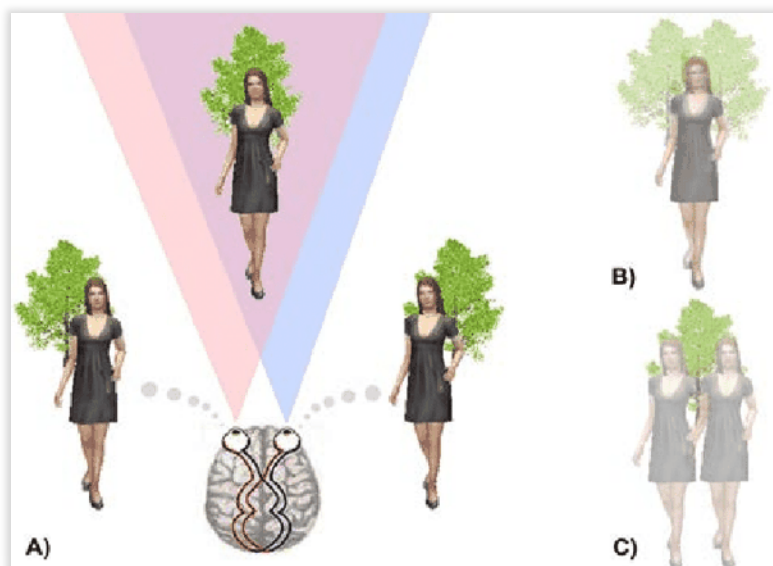
It is clear that kinesthesia can operate without visual support only on predefined spaces and/or preordained patterns, which do not exist in a situation sport such as the clay target shooting. This might have consequences in the quality of this information and its correct integration which depend on the musculoskeletal activation, the technique and tactics of the movement.

Vision is the guide of the motor system.

(Lee 1974) (Mark, Warren & Wang 1987)

The quality of proprioception, even without active use of the visual function, highly depends on the correct integration of this information from the visual system with the vestibular system and the somatosensory system. Perceiving, organizing and coordinating in order to control movements, performing an action is a process constantly learned during sensory, mental and bodily development. Re-educating, training and strengthening this process will lead the athlete to the maturation and refinement of the central nervous system allowing him/her to make the execution and management of the technical gesture more and more effective over time.

According to the principles of Sport Readiness mentioned above, the technical gesture must take place with an ideal execution, organized in the shortest possible time and with the minimum mental and physical effort. To make this happen we need to make the visual system effective and efficient so that it will provide the central nervous system with the correct information, minimizing the stimuli to be processed even if they are extended over time. On the contrary, the result of an incorrectly developed and integrated visual system will be a poorly efficient quality of movement and very expensive from an energetic and emotional point of view which will negatively affect the



A) Stereoscopic vision analysed by the human brain, B) View focused on the woman, C) View focused on the tree
Photo by researchgate.net

sport performance. At this point it is necessary to understand how the visual system works in clay target shooting in order to better perceive the target and to be able to organize a motor response (mounting, shooting movement, etc.) as accurate as possible.

In both disciplines the eyes must both be open and must be kept in

an active vision state until the call is made. By active vision we mean a state of activation of the

sensorial system characterized by a high visual and proprioceptive attention in which every perceptive detail of the person, the environment and the main target is processed and stored generating a high awareness of the gesture and reduced automation times. In order to work on the achievement of an active vision state we must perform an evaluation of the sensorial features of the athlete and especially of his/her visual system. With both eyes open our brain receives, integrates and processes two images coming from two different angles and thanks to this feature provides us with a three-dimensional image of reality, the STEREOPSIS. This brain ability, however, does not provide us with a fundamental information for an athlete: which eye is more efficient in the management of the fixation of the stimulus and which one in the management of peripheral vision. The most performing eye in the management of the fixation is the dominant eye, which today is defined as the technical eye, because its features include:

- prevalent management of central vision
- speed in taking fixation on moving objects
- higher quality of the perception of colours

We will no longer define it as dominant because the contralateral eye, what we call the tactical eye, plays an equally important role:

- prevalent management of vision, perception and peripheral awareness
- high kinetic discrimination power (where the object is positioned and how much it moves in the visual field)
- main sensory and directional centre of the kinesthesia



The quality of the visual-motor coordination and therefore of the actual technical gesture depends in fact on its perceptive speed and effectiveness in the use of peripheral stimuli. The space resolution, actually, decreases proceeding from the fovea centralis (point of maximum quality of vision) towards the retinal periphery where instead the temporal resolution progressively increases, which means the ability to perceive and interpret movement.

We will list here some skills that in clay target shooting should be assessed, trained and enhanced; we will not focus on their neurophysiological features as this is not the right context to do so, but we invite you to personally explore each of these skills to understand how important they are in our sport:

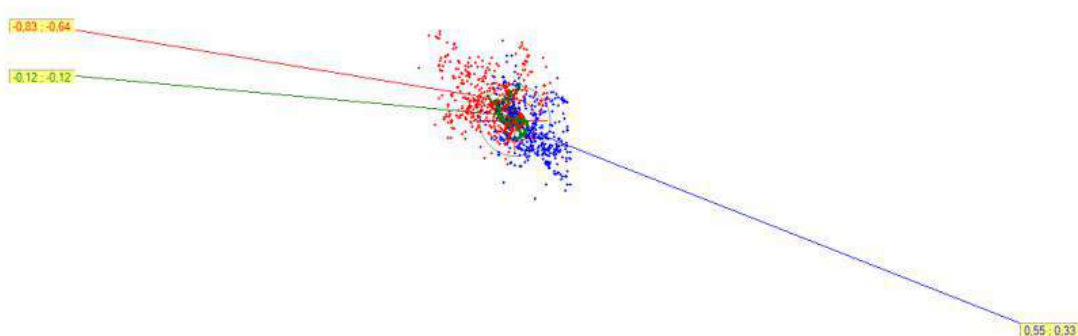
- Strength and endurance of the extrinsic oculomotor muscles
- Central Vision (Visual Acuity)
- Near point of convergence - ability to follow an approaching object
- Peripheral awareness - ability to perceive what is happening in the field of vision
- Slow tracking eye movements (PURSUIT)
- Quick jump movements (SACCADES)
- Stereopsis
- Eye-hand space localization
- Eye-hand coordination (right, left, two-handed)
- Eye-body coordination (functional asymmetries)

Identifying the eye dominance and enhancing all the skills described through specific training monitored by a vision professional is a fundamental step in an athlete's path to growth and to performance enhancement.

INITIAL MOVEMENT IN TRAP

In the Trap discipline the shooter has already completed the mounting movement by the time of the call, so he must be ready to read the target's trajectory and start the movement with the shotgun towards the target. A fundamental part of the technique described in this section is the difference between the target's calling action, described in the previous chapter, and the movement towards the target. It is indeed easy to notice that some shooters associate the initial movement with the calling phase, with the consequent risk of an anticipated action with respect to the perception of the target's trajectory and a misalignment of the body segments due to uncontrolled and unconscious input. On the contrary, in order to obtain greater benefits, the shooter must wait for the exit of the target keeping the same position and start the movement only when, through the visual system, has received the information regarding trajectory, speed, angle and depth, while paying attention that the target has passed the point where the gun barrels are positioned and have not left the shooter's field of vision.

In order to be able to do this, the shooter must hold an active state of vision until the time of the call. During the active vision state about three micro fixations occur on average per second, in these cases each fixation has a varying duration (300-500 ms).



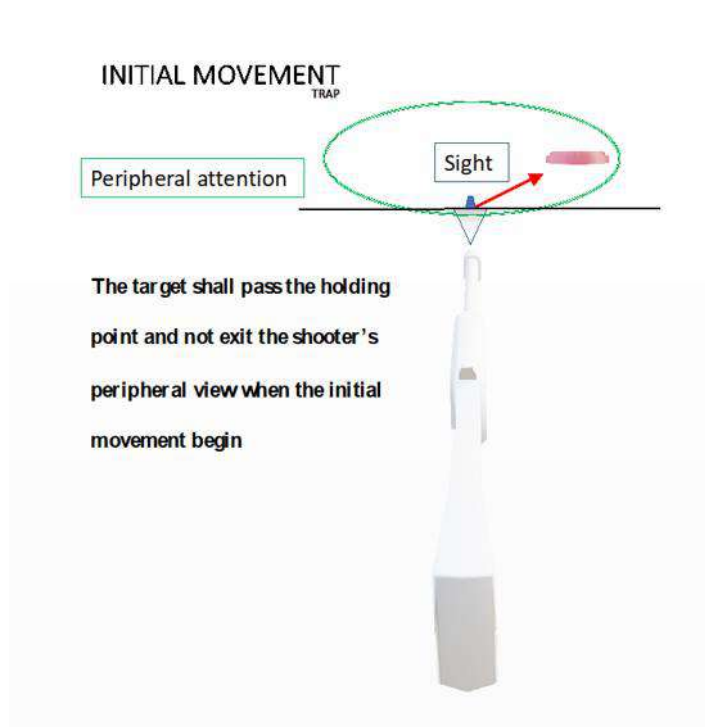
Fixation test using eye-tracking software, in which all microtransactions are observed

(blue: right eye, red: left eye, green: binocular vision in fixation)

Photo by Americo Meale

These very fast fixations are interrupted by rapid eye movements, called micro-saccades, with a speed that can exceed 700°/s, which allow the active vision area to be explored.

The perception and processing of the visual signal in this area regulates the motor programme necessary for the following movement of the eyes towards the target.



When the target is released, through the active vision state the shooter is in full control of all the elements within his field of vision, with the awareness that he can take full advantage of the most functional features of the visual system for each phase of the movement. In other words, in the initial phase, the athlete needs to read the correct information regarding distance, speed, angle and position of the target and

to do so, the use of the peripheral awareness of the tactical eye is necessary, avoiding going into fixation on the target. This is obviously not enough, as the shooter must make a body movement enabling him to bring the shotgun in the correct direction up to the firing point. The muscle chains required to 'activate' the technical gesture are those on the opposite side of the mounting, namely the arm, shoulder and back muscles, while at the same time the hand placed on the fore-end is responsible for directing the shotgun on the same trajectory as the target. It should be pointed out that these muscle chains provide inertia to the movement, though they will be followed in a natural way by the whole body, which will have to move in sync with the shotgun. From the very first moment the movement must be smooth and fluid, without sudden jerks or misalignment of the body parts caused by an incorrect waiting position or by the gun barrels moving out of the field of vision, which will then be unconsciously pushed towards the target without any control over the movement. A key element to

be taken into consideration is the shifting of the shotgun barrels right next to the centre of the active vision area, but without putting them in fixation, as soon as the eyes begin their movement towards the target.

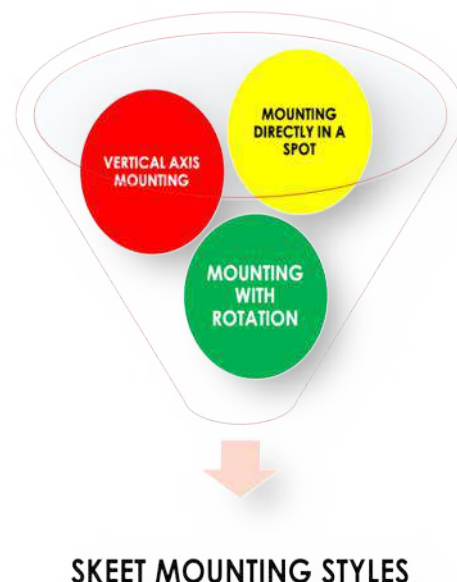
GUN MOUNTING IN SKEET

Before proceeding with the description of how the initial movement towards the target takes place in the Skeet discipline, it is worthwhile to analyse the mounting movement each athlete makes after the call of the target.

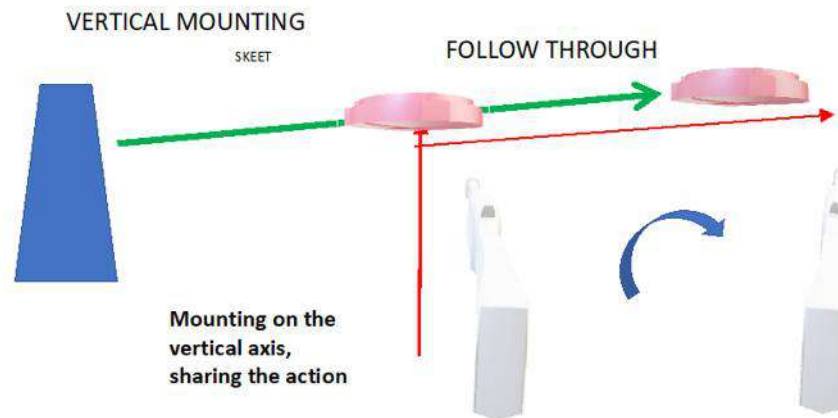
A good mounting must allow the shooter to achieve and keep a good cheek contact on the stock of the gun throughout the technical movement, thanks to which he will be able to have a correct eye-gun alignment. In addition, the mounting action must ensure that the pelvis-shoulder alignment is held and that the head is in a stable position in order to avoid excessive activation of the oculocephalograph reflex.

A number of different mounting techniques exist, which are closely related to the shooting style used by the shooter, and we will summarise them as follows:

- Mounting on the vertical axis;
- Mounting with end at the firing point;
- Mounting with rotation.

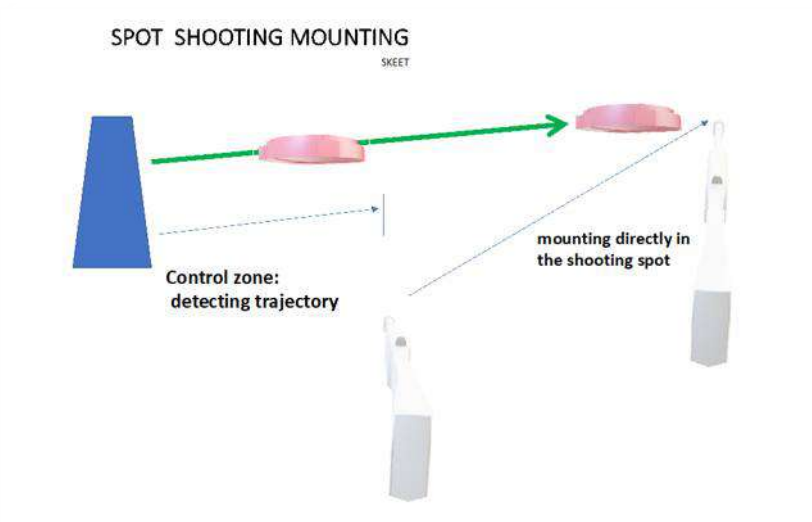


The mounting on the vertical axis is a movement that is performed by carrying the shotgun on the shoulder without worrying about finding the alignment with the flight path of the target, which will be carried out only after.



In this mounting technique the body and especially the head of the shooter remain in a stable position until the cheek touches the stock, after which the actual movement towards the target begins. In doing so, the athlete completely separates the two actions: once the mounting phase is over, the shooter will need to use the thrust from the back and leg muscles so as to move the shotgun in the direction of the target. In this way he will be able to quicken the movement to achieve the correct connection with the target and pull the trigger with the barrels always moving. In this specific style of mounting, some shooters prefer to end the mounting movement by keeping the barrels slightly in front of the target, while others end the mounting action with the barrels going 'on the target'; in both cases, a quick mounting action is required and, particularly in the first case, they tend to prefer a slightly more open positioning of the barrels with respect to the cabin.

In the mounting ending at the firing point, the athlete performs the movement with a rotation causing him/her to end the mounting at the very moment when the tip of the barrels reaches the firing point and the stock makes simultaneous contact with the cheek and shoulder.

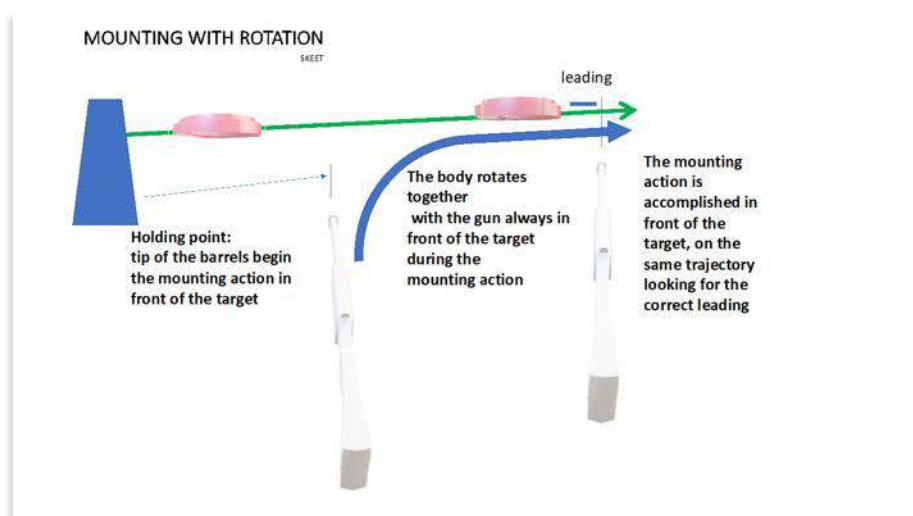


In this technique the hand positioned on the fore-end guides the shotgun towards the firing point. The shooter's shoulders and head move slightly following the direction of the barrels, which are oriented in a controlled manner,

aligning with the flight path of the target towards the firing point. The hand on the pistol will make a short and rapid movement in order to allow cheek-stock contact at the very moment of closing the shooting action. As the mounting is completed at the firing point, the shooter has more time available to perform it and therefore will not need to be too fast, thus relying on a more comfortable and relaxed movement. Great precision is required in reading the trajectory and calculating the correct advance to be given with respect to the target, as it is not possible to make any changes to the alignment on the flight path of the target.

The mounting with rotation, finally, consists of a mounting movement performed during the rotation towards the flight path of the target.

In this technique, the mounting is completed during the flight of the target, before it reaches the point where the shooter decides to fire,



making sure that the barrels are in front of the target on its trajectory when the mounting is

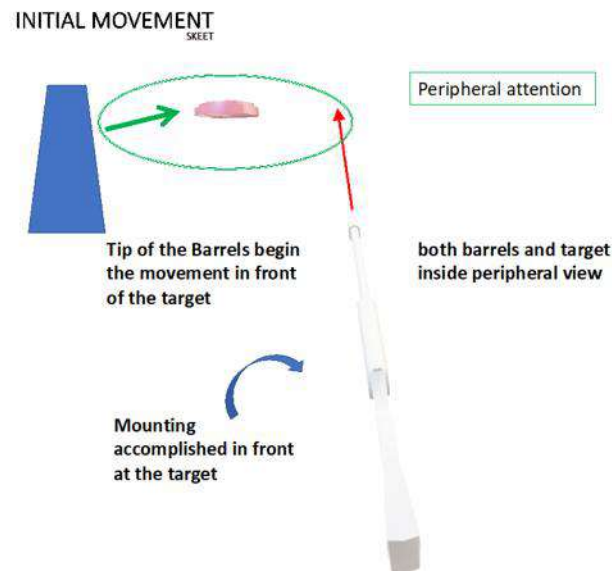
completed. Since this mounting technique is the one adopted in this manual, all the dynamics will be explained in detail during the phases of the movement in which it is used, namely the initial movement phase and the transition phase towards the target.

INITIAL MOVEMENT IN SKEET

In the Skeet discipline, the shooter, once the call is made, must be ready to combine the information received through the visual system concerning the target's trajectory with the initial mounting phase. The call of the target, as previously described, is slightly extended in order to reduce the waiting time for the exit of the target, which as it is well known can vary from 0 to 3 seconds. In any case, just as in the Trap discipline, the shooter must separate the movement action from the call and start the technical action only after having perceived the exit of the target and received the information concerning its flight. A very important factor to take into account is that the micro-saccades can last over time due to the different timing of the target's exit and it is therefore essential to keep a constant focus in the active vision area without disturbing elements drawing fixation causing out-of-target eye movements.

In this way, after making the call, the shooter is able to have control of all the elements within his field of vision, so that, thanks to the use of peripheral attention, he/she can perceive the target, without putting it into fixation, as soon as it begins its flight and at the same time the shooter can also perceive the tip of the gun barrels moving as soon as he/she starts the technical gesture. In the initial phase, therefore, both the target and the shotgun are kept within the athlete's peripheral vision, who must repeat this action for each individual platform in the same way, regardless of the eye hold position used. As it happens in the Trap, the muscle chains in charge of starting the technical gesture are those on the opposite side to the mounting, namely the arm, shoulder and dorsal muscles, while at the same time the hand on the fore-end is responsible for directing the

shotgun towards the trajectory of the target, raising it along the vertical axis with the support of the hand on the pistol. The head and the body hold the same position and it is important that the shotgun, from the very first moment, stays close to the athlete's body without being pushed forward in any way.



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Self evaluation

1. Sport Readiness: what it is and which factors influence it?
2. Initial movement in Trap and Skeet: define how to start the movement in the two disciplines and the differences between them.
3. Visual System: define the main features of the technical eye and those of the tactical eye
4. What is the difference between sight and vision?
5. What is active vision?

6. Explain how the visual system is used during the call and during the initial movement in both disciplines.

7. How can the mounting in the Skeet be carried out?

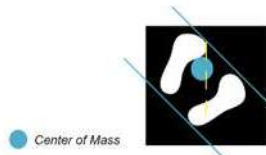
4. TRANSITION PHASE OF MOVEMENT

The transition phase of movement takes place right after the initial movement until the moment the shooter decides to pull the trigger. During this phase the athlete must be able to find the correct alignment of the shotgun on the flight path



of the target, keeping all the essential elements for a successful shot within the field of vision, avoiding being influenced by disturbing elements that may compromise the correct execution of the shot. In particular, in the Skeet discipline, as the athlete has not yet completed the mounting movement of the shotgun, he/she must also be able to achieve the eye-gun alignment, thanks to the correct positioning of the shotgun on the shoulder and the contact of the cheek on the stock.

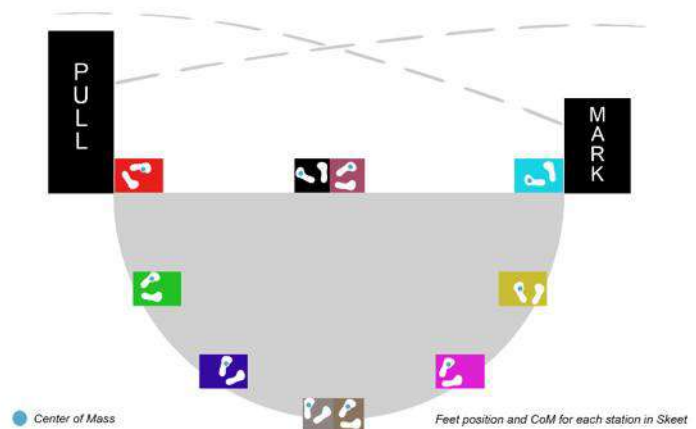
In order to ensure the right input from the visual system, it is essential to take into consideration the body posture and head position the shooter must hold until the end of the transition phase, with the aim of avoiding problems caused by poor stability and/or excessive activation of the oculocephalograph reflex. Before proceeding with the detailed description of how the transition phase is to be carried out in each of the two disciplines, it is worth reviewing the notion of centre of mass and how this affects the stability of the shooter.



Feet position and CoM in Trap

The centre of mass of a system is that point for which the system behaves as if its mass were all concentrated at that point. In shooting disciplines the reference system to be considered is composed of the human body and a second body which is the shotgun: this implies locating the centre of mass at a slightly more advanced point than a simple upright position of the human body

without a shotgun. For this reason, as already seen during the course in which we have treated the waiting position, the shooter must take care that the projection of the centre of mass on the ground always falls within the foot support base, so that the shooter can keep a stable position: this principle must also be used during the transition phase of the movement towards the target, since any movement of the centre of mass outside the support base could cause a loss of balance, with consequent problems in the execution of a positive shot.



TRANSITION PHASE IN TRAP

Once the movement towards the target has started, the shooter, who already knows all the information about the target's trajectory, speed, angle and depth, must reach the target and catch it with a linear movement up to the firing point.

In the technique described in this course, the athlete starts the movement, as explained in the previous chapter, only after the target has passed the point where the barrels are positioned, i.e. when he/she is already above the line of sight and after passing through the peripheral vision area. This will enable the shooter to detect the trajectory and then follow it with an accelerating movement to the point where he decides to strike.

During the transition phase towards the target the eyes must be kept in an active vision area not



focused on the background but with a focus close to the tip of the gun barrels. In this way, thanks to the short saccades reproducing the trajectory followed by the target, the shooter is able to keep the barrels of the shotgun under his control during the whole movement, gradually perceiving the reduction of the distance between them and the target. Being always in visual control of the movement also allows the athlete's body to be at all times prepared to perceive any flight trajectory and therefore avoid any breakdown. Muscle chains must keep on working in synergy, with the side of the body

opposite to the mounting side that continuously plays the role of 'guide' in the thrust; in particular, the hand on the fore-end is responsible for the direction of the shotgun and it also makes the adjustments if necessary, while the hand on the pistol must stay completely relaxed being totally carried, without making any contribution to the movement. Similarly to the hand on the pistol, the pelvis will only tend to follow the movement without changing its position; the knees must be kept

'unblocked', as they are during the waiting position, in order to avoid imbalances that would create misalignments in the athlete's body segments.

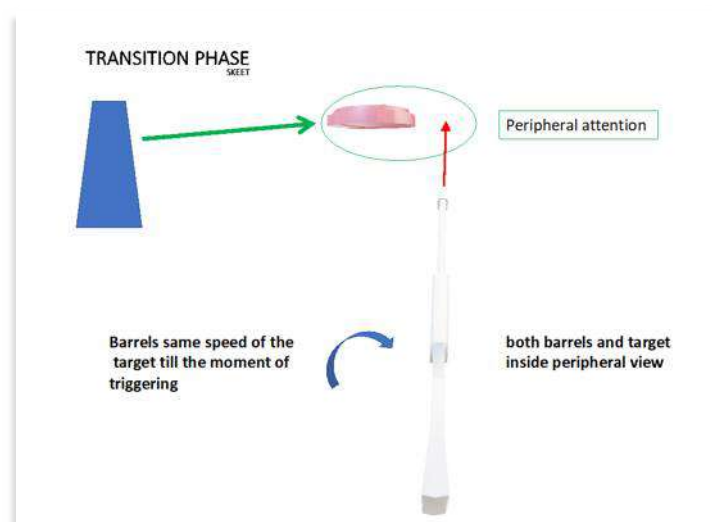
Particular attention must be paid to the shoulders, which must support the movement, while avoiding forward or backward movements that could compromise the shooter's stability. The concept of stability is very important in this phase, in fact if the shooter is able to maintain a stable position throughout the transition phase then he/she will be in the best possible conditions to achieve a positive shot. In this regard it should be pointed out that the centre of mass, or rather its projection on the ground, must keep its position with respect to the feet almost unchanged from the waiting position until the end of the technical action.

Finally, the role of the head should not be underestimated, in fact it must be kept in contact with the stock, but without forcing its position, so as to always have the correct eye-gun alignment and avoid a variation in the height of the eye on the line of sight.

TRANSITION PHASE IN SKEET

In the Skeet discipline, contrary to the Trap discipline, the shooter starts the movement, including the mounting, as soon as the information concerning the flight of the target is received and does not wait for the target to pass the barrels waiting point. In the technique used in this manual, during the transition phase,

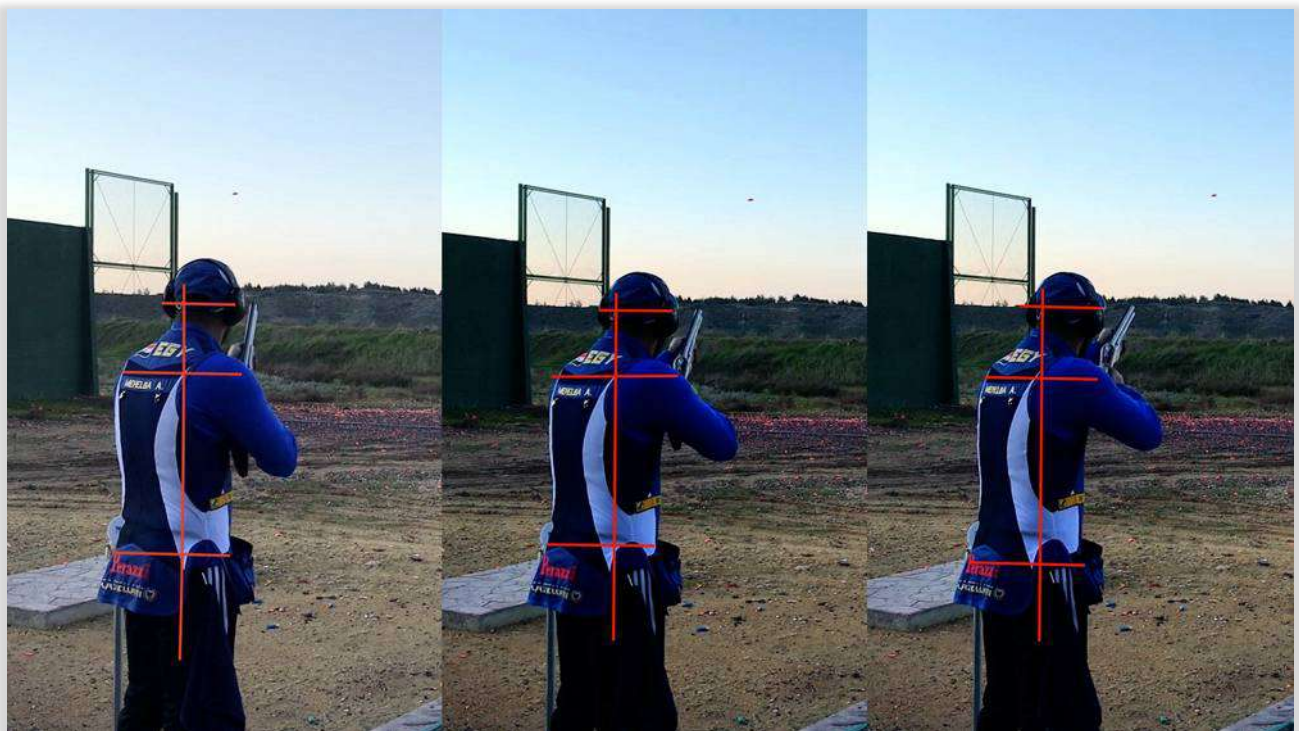
the athlete must end the mounting movement of the shotgun by pointing the barrels forward with



respect to the target on its flight path, and then continue in the same direction, looking for the correct timing before deciding to strike.

The eyes, right after reading the information concerning the target's trajectory and as soon as the shooter has started the technical gesture, must be pointed on the movement of the shotgun in an active vision area not focused on the background but with a focus staying close to the tip of the barrels. By doing so, thanks to the short saccades reproducing the trajectory that the shotgun must make, the shooter is able to have full control of the mounting action up to the point where he will cross the projection of the target's trajectory, which is the point where the mounting is completed.

The mounting action of the shotgun must be performed with the body making a rotation in order to allow the shooter to bring the barrels in front of the target on its line of flight.



The muscle chains must work in synergy and be aligned with each other; in particular, it is essential to preserve the alignment between pelvis and shoulders. The hand on the fore-end other than giving the direction to the shotgun, has the task of guiding the weapon along the vertical axis until the mounting is completed, with the support of the hand on the pistol which raises and places the stock

on the shoulder in a very precise manner: the whole mounting movement must take place with the shotgun staying very close to the body; the arms will take charge of this action, supported by the dorsal muscles. In any case, it should be underlined that even during this phase it is the side of the body opposite the mounting side to control the movement.



At the end of the mounting action, the eyes, keeping a focus close to the tip of the barrels, thanks to peripheral awareness, perceive again the target and define its distance from the shotgun. The hand on the fore-end, at this point, ends the thrust along the vertical axis and simply directs the weapon to align it with the flight of the target, while the hand on the pistol must stay completely relaxed, being carried away by the movement itself. The opposite side of the body to the mounting keeps on playing the role of 'guide' in the thrust; in this last part of the transition phase the objective is to find the correct timing on the target,

aligning the shotgun on its flight path and holding its own speed until the moment the athlete decides to hit it.

The knees must be kept 'unlocked' throughout the action, so as to avoid any blockage during rotation, while the pelvis will hold its position only by following the movement of the body. The shoulders must be actively involved during the whole movement, but always keeping their position and alignment with the pelvis, avoiding forward or backward movements that can cause the shooter to lose stability.

The head plays a very delicate role, in fact, as it is not yet positioned on the shotgun, it must be kept as straight as possible on the vertical axis and in the same position during the rotation in the mounting phase, until the cheek comes into contact with the stock: this phase must be carried out with particular

care, as the head must simply wait for the arms to complete the mounting action, avoiding going towards the shotgun and thus changing the position with all the consequences that may result, such as problems in alignment, different angle of vision and excessive activation of the oculoccephalograph reflex. At the end of the mounting, the head must be kept in contact with the stock without forcing its position, so as to always have the correct eye-gun alignment and avoid a variation in the height of the eye on the line of sight. As in the Trap, it should be specified, given the same principle of stability, that the projection on the ground of the centre of mass must keep its position almost unchanged with respect to the feet from the waiting position until the end of the technical gesture. In doubles the shooter makes two transition phases towards the target, one for the first target and the other for the second. The transition phase towards the second target is like the transition phase towards the first at the end of the mounting movement: the shooter, after firing the first target, must check the second target and its distance from the barrels through peripheral awareness, and then search for alignment and correct timing before hitting. Even in this case, the movement is carried out on the opposite side of the body to that of the mounting and all the muscle chains work exactly as in the transition phase to the first target.

The shooter must try to make the transition towards the second target with the barrels always in front of it once he perceives it, but sometimes it can happen that the target is perceived after it has already passed the barrels: in this case the athlete must have the ability to accelerate the movement by overtaking the target and finding the correct anticipation before firing.

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Self evaluation

1. Describe how to manage the centre of mass during the transition phase
2. Visual System: describe how it works during the transition phase in both disciplines
3. How does the transition phase to the second target in the Skeet take place?

4. Mounting in the Skeet: describe how it ends
5. What are the muscle chains driving the technical gesture in both disciplines?
6. Describe how the body should act

5. SIGHT PICTURE

The sight picture is the image that is produced in the shooter's mind at the very moment he decides to pull the trigger. Being able to define and stabilise this image allows the shooter to instantly recognise the time at which to hit the target and automate the whole technical gesture: the more the athlete is able to use a correct sight picture, the higher the chance of achieving a positive shot. The production of the sight picture differs



according to the shooter, the technique used, the height of the eye on the rib and other factors, such as, for example, the features of the gun barrels and the features of the cartridges used.

In the following paragraphs we will describe the correct sight picture to be used according to the changes in some of these factors, but always concerning the shooting technique described so far, both in the Trap and in the Skeet.

THE CONCEPT OF ANTICIPATION IN THE CLAY TARGET SHOOTING

Before we describe the proper sight picture in both disciplines, it is worthwhile to introduce the concept of anticipation in the clay target shooting disciplines. In both disciplines, in fact, the shooter must hit targets with different angles from time to time and, above all, at a certain distance from the point where he is standing: for this reason, when he pulls the trigger, the pellets creating the shot pattern need a certain amount of time to reach the point where they must impact the target and it is therefore necessary to foresee an anticipation with respect to the target in order to strike it.

The mathematical calculation of how much anticipation is necessary for each target must take into account many factors; first of all, given the speed of the target and the cartridge, starting from the initial speed, it is necessary to evaluate how they are affected by air friction and their slowing down to the point where the athlete is looking for impact. Other factors to be evaluated include the length of the gun barrels, the constriction choke, the possible humidity of the powder in the cartridge, the shooting technique used and some features of the shooter, i.e. at what distance he usually hits the target.

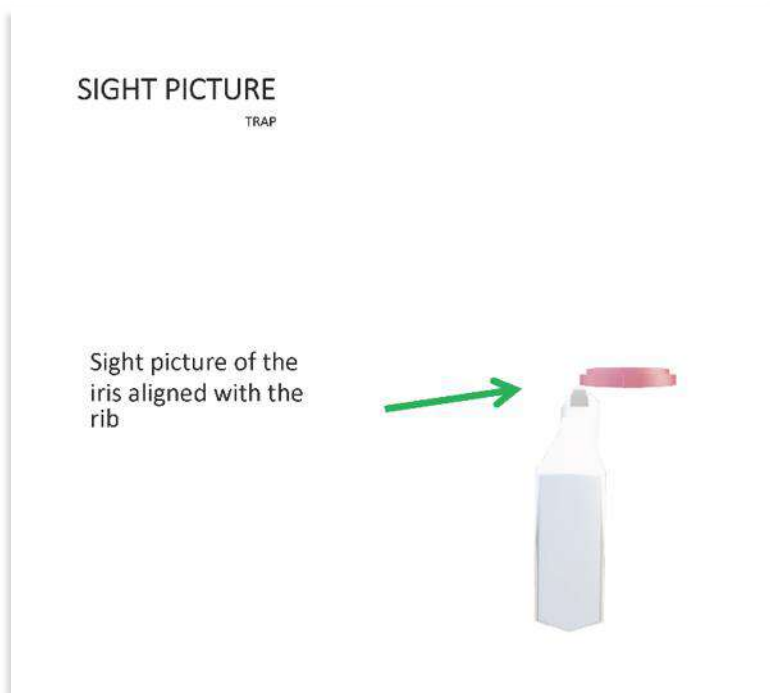
More than the mathematical calculation, however, it is important to be able to practically determine how to reach, on a visual level, the anticipation needed to hit the target; it is precisely because of the creation of the sight picture that all this will be possible.

SIGHT PICTURE IN TRAP

In the Trap discipline the sight picture must be created at the end of the transition phase, at the very moment when the eyes, thanks to an additional short saccade, finally enter into fixation with the target and, at the same time, the shooter makes a small acceleration with the barrels to keep them within the active vision area. More specifically, for the technique described, the athlete must keep the barrels

moving even during the firing phase, obtaining the so-called SWING or FOLLOW THROUGH: for this very reason the decision on shooting must be made when the barrels have almost reached the target. By doing so, in fact, since there is a short delay from the decision to the actual execution of the shot, the barrels will be in anticipation of the target when the shot will be made, while if you expect to pass the target without ever stopping the movement, the anticipation will be excessive and the shot pattern will not hit the target.

At this point we can only define the correct sight picture on the basis of the many variables now known, dwelling particularly on the influence exerted by the height of the eye on the rib in such a decision. Generally, if the iris turns out to be tangent to the line of the rib it is advisable to keep the target slightly above the barrels when the athlete



decides to shoot, more precisely as soon as the barrels 'touch' the target without waiting for them to cover it. The features of the shooter, however, may make it necessary or simply advisable to have different heights of the eye on the rib: for example, if we consider a fast shooter, it is advisable to have a greater height of the eye on the rib, with immediate consequences on the creation of the sight picture, which must at this point be with the target on top of the barrels and which, at the moment of the shooting decision, must be perceived slightly 'detached' from the target; the greater the height, the more the barrels will be detached from the target. In the opposite case, i.e. a slow shooter, it is appropriate to create a sight picture with the perception of the tip of the barrels staying on the same line of the target or even covering it, with the eye lower than the line of the rib, which will cover a

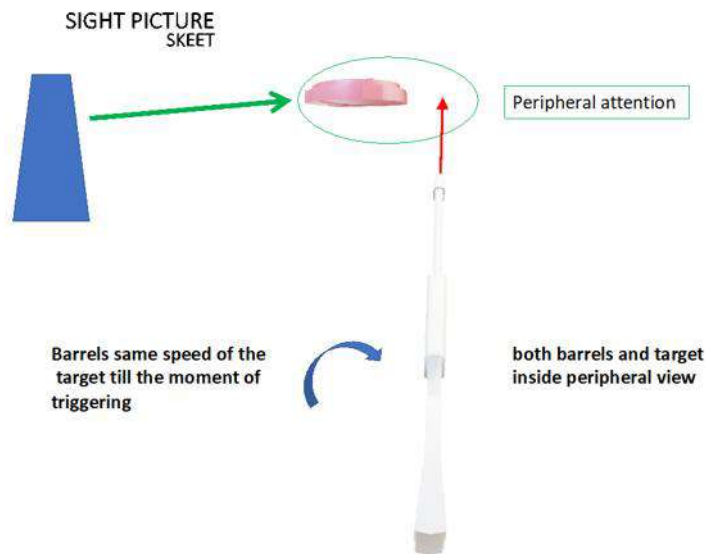
part of the iris; the lower the eye will be compared to the rib the more the shooter must cover the target.

If the shooter fails the first shot, he/she needs to define a second sight picture, thanks to which he/she can succeed in hitting the target, but given the close distance between the target and the tip of the barrels, which continues to be kept moving, this time the shooter will have to do so in a slightly different way. In fact, after firing the first shot, he/she must re-establish the vision with a focus near the tip of the barrels and through the peripheral vision, perceive the remaining trajectory of the target, raise the barrels and hit it without ever putting it into fixation.

SIGHT PICTURE IN SKEET

In the Skeet discipline, at the end of the transition phase, during which the barrels of the gun are placed in front of the target on its trajectory, the eyes must be kept in a state of active vision thanks to which it is possible, through peripheral awareness, to perceive the target and its visual distance from the tip of the barrels.

The creation of the sight picture must take place at the very moment in which this visual distance allows the shooter to get the correct anticipation on the target, without ever putting it into fixation. Since the Skeet is a discipline in which the trajectories of the skeet are known, but in which the athlete's position changes taking on different angles and distances, the visual distance to be kept between the tip of the barrel and the target varies slightly from platform to platform, also depending on the features of the shooter and the many factors involved.



As far as the height of the eye on the rib is concerned, generally the iris is covered for a quarter by the rib itself and the shooter must bring the barrels of the shotgun on the same line as the target. In the last few years we have been using a height of the eye similar to that used in the Trap, with the iris

tangent to the line of the rib, because the target are faster and more visibility and speed are needed in the technical gesture: in this case the athlete must bring the sight on the same line of the target.

In the technique described, remember that when the shooter decides to fire the shot, the barrels must travel at the same speed as the target as soon as he/she gets the correct anticipation on it, in order to keep it until the firing phase. In double shots, the shooter needs to create two different sight pictures; however, the criteria used to create the second sight picture are the same as those used to create the first one, so the shooter must be able to create the same pattern for all the targets.

Therefore, it is possible to make a summary of what the sight picture should look like for each target on each platform, taking into consideration a shooter with his eye slightly lower than the line of the rib and who uses the shooting technique described in this course:

- Platform 1
 - Pull: the tip of the barrels is visually in contact with the bottom of the target;
 - Mark: in visual contact with the target, in front of it. Depending on where the shot is fired, however, the anticipation will change, the closer the target is to the shooter the greater the anticipation shall be;

- Platform 2
 - Pull: tip of the barrels in visual contact with the target, almost no anticipation;
 - Mark: tip of the barrels is nearly in visual contact with the target, while keeping a constant speed in the movement;
- Platform 3
 - Pull: one finger or 2 cm visual distance between the tip of the barrels and the target;
 - Mark: one finger or 2 cm visual distance between the tip of the barrels and the target, while keeping a constant speed in the movement;
- Platform 4
 - Pull: two fingers or 4-5 cm visual distance between the tip of the barrels and the target;
 - Mark: two fingers or 4-5 cm visual distance between the tip of the barrels and the target, while keeping a constant speed in the movement;
- Platform 5
 - Mark: one finger or 2 cm visual distance between the tip of the barrels and the target;
 - Pull: one finger or 2 cm visual distance between the tip of the barrels and the target, while keeping a constant speed in the movement;
- Platform 6
 - Mark: tip of the barrels in visual contact with the target, almost no anticipation;
 - Pull: tip of the barrels is nearly in visual contact with the target, while keeping a constant speed in the movement;
- Platform 7
 - Mark: tip of the barrels visually covering the target;

- Pull: tip of the barrels visually covering the black part of the target. The anticipation changes depending on where the shot is fired, the closer the target gets to the shooter, the greater the anticipation given shall be;
- Platform 8
 - Pull: tip of the barrels visually inside the black part of the target;
 - Mark: tip of the barrels in visual contact with the frontal part of the target.

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Self evaluation

1. Explains what it is and its purpose
2. Anticipation in clay target shooting: why does it affect the sight picture?
3. Explain how to define the sight picture in the two disciplines
4. List for each platform in the Skeet how the anticipation on the target can vary

6. TRIGGERING

Triggering is the actual firing action, namely when the shooter, by pulling the trigger, activates the shot. It is a very rapid action and is sometimes fully controlled by the athlete's instinct; as a matter of fact, several details able to produce a more or less efficient shot are not to be underestimated. In

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order to achieve a proper triggering the shooter must make a good reading of the trajectory, so as to get the right alignment of the shotgun with the target, as well as an excellent definition of the sight picture, which can allow him to get the correct anticipation when the shot is triggered. In addition, a thorough knowledge of the battery pack of the shotgun used, the setting of the clicks and the position of the finger on the trigger the athlete must hold.

KNOWLEDGE OF THE BATTERY PACK: SPRINGS AND CLICKS SETTING

The battery pack is the part of the shotgun most involved in the triggering phase; among the

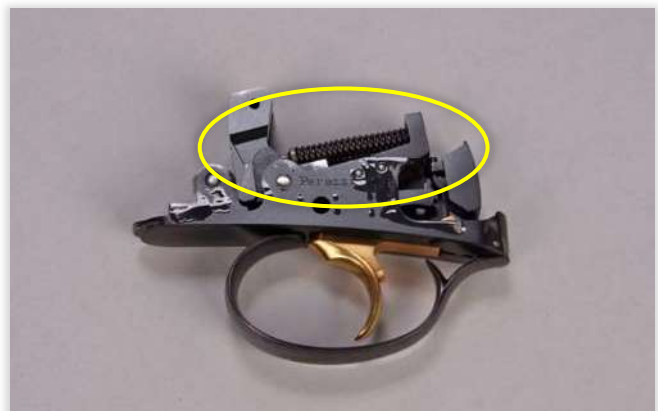


different elements composing it, it is important to focus on the choice of the springs used and the setting of the clicks.

The springs can be of two types, *helical* or *'V' shaped*: the 'V' shaped ones allow immediate traction, with a prompt return to

the original position, ideal for a first and a quick second shot, since they are instantly ready, but they have a tendency to break frequently and are therefore used exclusively in removable batteries. Helical springs, on the other hand, tend to last very long over time, but as time goes by their performance decreases and traction becomes less rapid and softer.

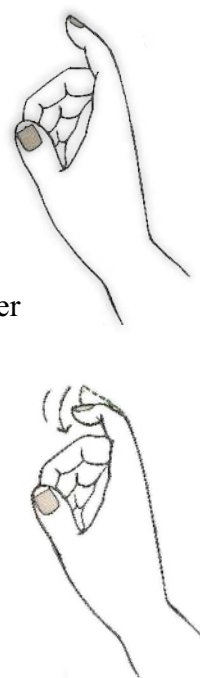
Regarding the setting of the clicks we must consider that each model of shotgun uses different types of them; usually in the Trap discipline they are about 1.2 kg for the first shot and 1.5 kg for the second, while in the Skeet discipline they are about 1 kg for the



first shot and 1.2 kg for the second. In the Skeet discipline the clicks are usually lighter than in the Trap, as a greater speed of execution is required due to the shorter distance from the targets. Depending on the shooter's skills, it is possible to opt for slightly heavier or slightly lighter clicks, and there is now a widespread tendency to avoid any unnecessary slightest movement in the clicks in order to have a more decisive and immediate trigger response. Each shooter, according to his/her shooting features and technique, must adjust and find the clicks most convenient for him/her.

POSITIONING OF THE FINGER ON THE TRIGGER

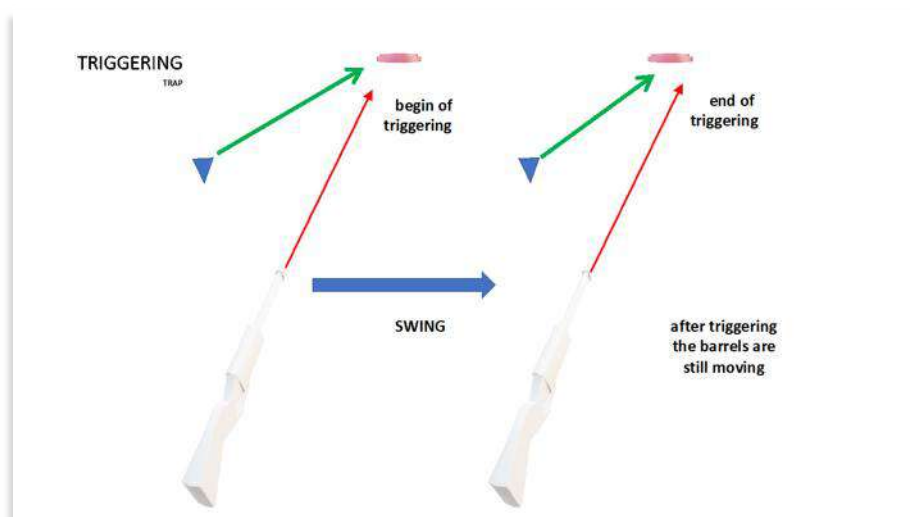
As previously analysed and described during the course on the construction of the waiting position, the position of the finger on the trigger plays a very important role in order to make a quick shot without extra movements that could affect the success of the shot itself. The shooter must hold the same position of the finger from the waiting position until when the firing action starts; for this reason it is good to remember that the best position to adopt is certainly the one with the fold between the third and second phalanx on the side of the trigger blade, with the third phalanx staying with a slight pressure on the trigger, ready for traction without stress that could interfere with the alignment of the gun barrels. An improper positioning can cause a delay in traction, micro movements and/or small unintended barrels movements, as in the case of a more backward or more advanced finger position than the ideal one. In the first case, the tip of the finger touches the side of the trigger blade, consequently traction is delayed because the pressure on the trigger is not exerted in the exact same direction as the trigger moves, but on the side, taking more time and force to activate it. Furthermore, by pushing the trigger blade sideways, the shotgun is slightly shifted with the risk of misalignment of the eyes with the rib or, since the tip of the finger is full of nerve endings, the shooter may



experience small jerks or micro movements that may result from excessive sensitivity under pressure. In the case of a more advanced finger position, on the other hand, the shooter finds himself completely wrapping the trigger until he touches it with the second phalanx on the central part. In this way, when he/she decides to pull, the finger makes a more complex movement before triggering, which results in a delay in firing. Moreover, after the first shot, as the shooter does not have the necessary strength to pull the trigger straight away, he is forced to extend his finger completely in order to trigger the second shot, with a longer execution time: this certainly causes more problems in the Trap, but also in the Skeet it is not suitable as the athlete, in double shots, has to reposition his finger on the trigger during the transition phase towards the second target, with the risk of losing stability in the movement. A further downside is that it becomes more difficult to keep the contact between the cheek and the stock, in fact, due to the weak strength of the finger and a traction that is exerted not directly in the same direction as the trigger but downwards, the shooter has to tighten the grip with a consequent change in the support of the head on the stock.

HOW TO CARRY OUT THE TRIGGERING PHASE

As already stated at the beginning of this chapter, the triggering phase is closely connected to the sight picture: more precisely, the sight picture represents the exact

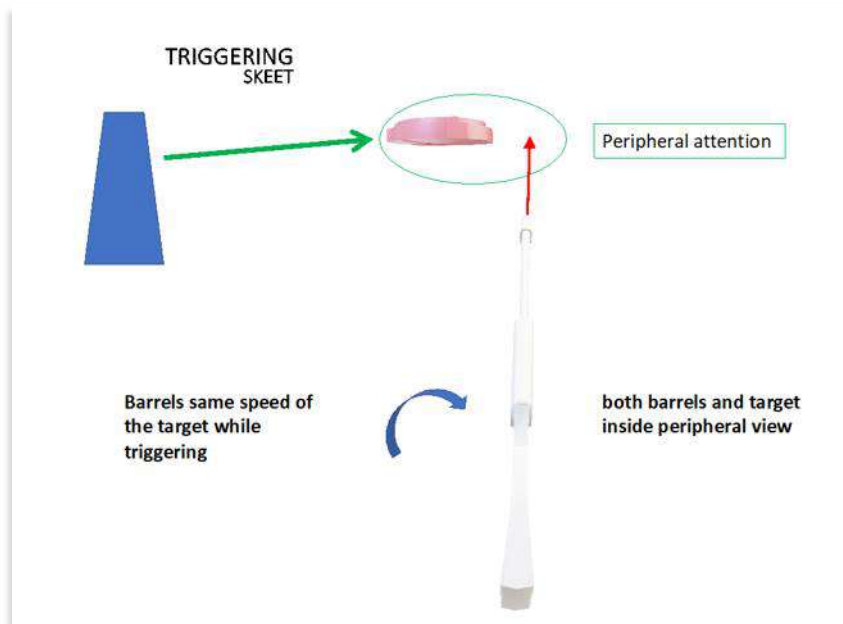


moment in which the brain delivers the impulse to pull the trigger; the transmission of the impulse

starts from the cerebral cortex and runs through the nerve endings and reaches the finger muscles responsible for pulling the trigger with a delay of two tenths of a second.

In both disciplines the traction must be short and firm, the shooter must activate only the finger muscles, holding the hand on the pistol with a solid but at the same time relaxed grip and keeping the same pressure until the end of the shot.

To better understand how the firing action also affects the anticipation to be given to the target, it is worth describing how to keep the movement of the shotgun, for the technique described here, with respect to the target when pulling the trigger: In the Trap, traction begins when the shooter can see the tip of the barrels of the shotgun completely reducing the distance from the target image, and



then ends when, thanks to a continuous and accelerating movement, he/she has already passed the target and thus achieved the proper anticipation; in the Skeet, on the other hand, the shooter begins traction when he perceives he/she has achieved

the correct anticipation, and then ends it with the same feeling, because the shooter keeps the speed at which the shotgun is moving equal to that of the target.

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Self evaluation

1. Which elements of the shotgun influence the triggering?
2. How to set the clicks in the two disciplines? When are they slightly modified?

3. Describe what is the correct finger position on the trigger and why
4. Explain the triggering action in both disciplines

7. POST SHOT ACTION

At the end of the first shot, in both disciplines, the shooter performs a short action before opening and disarming the shotgun or, if necessary, before continuing the movement to make the second shot. If the shooter has to use the second shot, this short phase after the shot becomes crucial to achieve a positive result, in fact, thanks to a good action quickly performed, the athlete can correct any trajectory error or anticipation of the target. Since it is always more appropriate to automate every single phase, it is advisable to execute this sequence even when the second shot is not necessary.

The eyes and the barrels of the shotgun must continue any movement always 'travelling' together; in particular, the eyes must be kept in an active vision area, not focused on the background, but with a focus that must stay close to the tip of the barrels.

WHAT HAPPENS IN THE TRAP

In the Trap discipline, the shooter is given two shots (excluding the finals) for each individual target, so right after the first shot he/she must check if the target has been hit or, if not, try to make up for it with a second shot.

The eyes, as previously mentioned, must stay in a state of active vision, with the tip of the barrels always within the active vision area, so that the shooter can perceive, through peripheral awareness, whether the target has been hit or not. All of this must take place with the shotgun kept moving even immediately after the shot, the so-called Follow Through, thanks to which the shooter slows down the movement of the shotgun without ever stopping it: this allows the athlete, once he/she has received the information from the visual system regarding the possible failure to break the target, to make, where necessary, changes to the trajectory followed by the weapon and try to get the correct anticipation, and then try to hit the target at the end of a further acceleration.

WHAT HAPPENS IN THE SKEET

In the Skeet discipline the shooter has only one cartridge for each target, therefore the action to be performed after the first shot is fundamental only in the double shots, even if, as already mentioned, it is recommended to perform it in the same way also in the single shots in order to make the action automatic.

Just as in the Trap, right after the first shot, the eyes must be kept in a state of active vision, with the tip of the barrels always within the active vision area, but in this case, unlike the Trap, peripheral awareness must be used not to perceive if the target has been broken, but to detect the second target. At the same time the movement of the shotgun must be slowed down and this happens thanks to the support of the dorsal and abdominal muscles, which allows to align the tip of the barrels to the trajectory of the second target and to instantly search for the correct anticipation, to then start the second transition phase in the same direction as the target.

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Self evaluation

1. How to use the visual system after the first shot in both disciplines?

2. Explain what Follow Through in the Trap consists of
3. Define how the body's muscle chains act in the Skeet

8. SHOOTING STYLES

In the history of the clay target shooting disciplines there have been several schools that have left their mark and characterized the shooting style of each athlete who was a member; these schools were easily referable to more or less extended geographical areas (countries, groups of countries, continents) and each of these areas followed a common shooting style for all shooters. Sometimes a methodology was developed in a specific country, and due to their geographical and/or cultural proximity, other countries would take it as an example; this is how many styles came to life and they differed from each other for some features related to the posture of the body and type of movement towards the target. Among these, it is worth mentioning in the Trap those of Italy, America, Australia and Eastern Europe (primarily Czechoslovakia and Russia) or in the Skeet those of Italy, Cuba, Cyprus, Eastern Europe and America.

In more recent times, however, there has been a growing evolution, also due to new regulations, as well as a globalization of styles born from the exporting of philosophies of thought and shooting techniques outside their own borders: this has led to the development of different shooting styles even within the same school. For this reason, in this manual, a division of shooting styles is made only on the basis of the techniques used, since it is no longer possible to trace them back to a single school or geographical area.

The execution of the technical gesture can be interpreted and carried out in different ways, each shooter and/or coach prefers one method rather than another after a careful analysis of the benefits that the chosen technique can offer or simply because he is used to following a certain method since childhood.

In any case, it should be pointed out that there are many different types of style and that throughout the history of clay target shooting, each of these has been used by successful shooters at international level. The shooting styles can be summarised in the following three, for both the Trap and the Skeet discipline:

- Follow Through
- Spot Shooting
- Constant leading

Each style obviously has its own specific differences depending on the discipline in which it is used.

TRAP STYLES

By first analysing the discipline of Trap, we clarify that the shooting technique described in this course is actually part of the Follow Through style.

This style allows you to have a high level of control over the barrels of the shotgun during movement towards the target, in addition to the opportunity to lead the weapon for a second shot without having to start the movement again from the start, as the barrels are



always kept moving and are more easily adjusted in the event of an error in the trajectory or in the

anticipation given on the first shot. In order to perform it in the best possible way, the shooter must be able to make the gesture in a natural manner, without any particular muscular tension that could cause disjointed movements and consequent loss of control, which is fundamental to be able to hit the target.



In the Spot Shooting style, the shooter crosses the target's trajectory with the shotgun straight to the point of impact, the weapon is brought in the direction of this point following a different trajectory from the target. The moment the shooter decides to

strike, it is necessary to stop the shotgun, which will then be fully stopped during the firing phase, while keeping the correct amount of time in anticipation of the target. In this style, the athlete uses a high barrel aiming, which allows him to make a short and rapid movement, but at the same time great precision is required in locating the point of impact; furthermore, when firing with the shotgun not being in movement, the shooter, in the case of a first missed shot, must start the movement again from the start and be able to instantly locate a new point of impact where to take the barrels of the shotgun. To use this style, therefore, great precision and 'explosiveness' in movement is required. Finally, the style called Constant Leading, in which the shooter keeps a constant advance on the target for the entire movement. The athlete must keep the barrels pointed high so as to perceive the target and start the movement while the target is still visually below the shotgun: in doing so, the shooter will immediately search for the anticipation, which will then be kept until the moment of firing. In this style the athlete has an excellent control of



the first shot, however he/she may find it difficult to keep the anticipation on very angled targets and in the control of the second shot. Speed of execution is required both in the initial movement and in the search for the proper anticipation.

SKEET STYLES



With regard to the Skeet discipline, we clarify that the technique described in this course is part of the style called Constant Leading. This style of shooting allows the shooter to perform the technical gesture in a reduced range of movement and to have a better balance during the rotation phase

towards the target, as well as an excellent control of the first shot and the opportunity to manage the hitting of the second target with more time available. It should be pointed out, however, that in order to be able to achieve these gains, the athlete needs to have a good reaction time and above all to learn to finish the mounting quickly, always in front-facing position with respect to the target on its flight path. In the Spot Shooting style, the shooter carries out the gun mounting with a rotation ending right at the target's point of impact, while also seeking the correct anticipation of the target; as soon as the mounting is completed, the triggering action must take place. In this style the athlete has excellent visibility and control of the first target, but needs a lot of time to learn the technique and



preserve the necessary skills. In normal conditions the shooter gains the ability to achieve very good

results, while in particular conditions, such as bad weather or improper target setting, he/she may find it very difficult to make corrections on both the first and second target.

Finally, in the style called Follow Through, the shooter tends to separate the mounting action from the transition action: during the first one the athlete does not make any rotation towards the target, and the tip of the barrels, when the mounting is completed, is on the target or even behind it; at this



point the rotation towards the target starts, and the target will be hit with the barrels always moving as soon as the shooter has found the correct anticipation. The most obvious benefit is that it is possible to find the best alignment with the target even when the mounting is

improperly performed, but at the same time this

results in a wide range of movement before both the first and the second target, with consequent problems in reaching and hitting the second target. Quick execution of the mounting action of the shotgun and the ability to hold a balanced position despite a wide range of movement are required.

This section is on ISSF_CoachCourse_PowerpointPresentation.pptx from slide 52 to 56

Self evaluation

1. List the different styles and explain the pros and cons for each of them in both disciplines

9. CONCLUSIONS

In the execution of the movement towards the target, it is very important to pay attention to the smallest detail, however it is also essential to maintain an overall view of the whole technical gesture in order to achieve a perfect synergy and efficiency between the different body parts and the weapon, so as to deliver the best performance and with better control until the breaking of the target.

Dividing the movement made by the shooter towards the target into phases allows to define a shooting technique in a precise and totally personalised manner, suited to the technical and morphological features of the athlete, to the point of assuring the best performance with the minimum energy expenditure.

In conclusion, the knowledge of the many aspects, among which the functioning - only at a basic level - of the respiratory and visual systems, as well as the evaluation of the pros and cons of the different shooting styles, gives the coach the opportunity to choose among a wide range of solutions and to implement the ones he/she considers functional for each individual athlete.

Hence, each coach has the opportunity to broaden his/her technical knowledge and to develop a personal training methodology which, thanks to the scientific approach, will be firmly based on a solid foundation.

1. HOW TO DETERMINE WHEN TO MOVE THE TARGET

A particularly important element is represented by how to accurately determine the moment when to start the movement towards the target: in order to do so, it is necessary to be able to identify any factor that may negatively or positively influence this action. In this regard, it is recommended to first identify the basic foundations of the technique used and, subsequently, to move on to the evaluation of the factors that may influence the shooter's choice of when to start the technical action:

- In the Trap, as already described in the section on the technique used in this course, the shooter must start the movement only after the target has passed the point where the barrels of the rifle are positioned and has not left its field of vision, paying attention to perceive both the target and the tip of the barrels through peripheral vision. Furthermore, the shooter must always keep constant the angular distance, i.e. the angle of view, between the eye and the barrels. It is essential to be able to start the movement in any situation, with no changes in the shooting technique.
- In the Skeet, considering the technique used in this course, the shooter must start a movement which allows him/her to keep the tip of the barrels always in front of the target on his/her trajectory, to be repeated in any situation without modifying the shooting technique and, above all, the shooter's natural reaction time. The visual angle between the barrels and the waiting point of the eyes must be kept constant, moreover, in the initial phase of the movement, both the target and the tip of the barrels must be kept within the peripheral vision.

At this point, we move on to the evaluation of the factors that may affect the starting point of the movement, which can be defined, for both disciplines, as follows:

- Call
- Position of the barrels
- Weather conditions
- Functional status of the athlete

For each of them it is possible to carry out a detailed analysis with the appropriate changes and/or adjustments to be made.

The call may affect the reaction time based on delays caused by the target throwing machines and/or microphones; in particular, if the delay is caused by the throwing machines, the shooter is advised to slightly raise the eye-barrels system in order to avoid the 'out of time' in the Trap discipline, while in the Skeet discipline, in the case of a delay caused by the machine, the shooter is advised to keep the vision state active until when the target comes out. Instead, if the delay is caused by microphones, in both disciplines it may be useful for the athlete to vary the length and intensity of the voice or to keep the active vision state and the shoulder and abdominal muscles relaxed for longer.



The second element to be considered is the positioning of the gun barrels during the waiting phase, as this can certainly vary the reaction time and/or the choice of when to activate the movement. This positioning can be different in the Trap discipline according to:

- Crossing points, if the shooter decides to adapt the aiming according to the targets' crossing area, which varies depending on the pattern;
- Initial speed of the target: if this is too low, the eye-barrels system should be slightly lowered; on the contrary, when the speed is too high, it should be slightly raised;
- Throwing patterns: in the case of low target trajectories, the athlete must lower the eye-barrels system, while in the case of high trajectories, the eye-barrels system must be raised;
- Type of bunker: if it is high, the eye-barrels system should be raised; if it is low, the eye-barrels system should also be lowered;

With regard to the Skeet discipline the variables are:

- Type of cabin and field proximity: in this case it is advisable to slightly open the barrel pointing with respect to the cabin;
- Position of the throwing machines: the shooter needs to modify the pointing height of the eye-barrels system in order to determine the correct initial trajectory;
- Initial speed of the target: if this is too low the gun hold position must be closer to the cabin, if the speed is too high it must be further away from the cabin;
- Launching trajectories: if these are low, the gun barrels must also be lowered or raised if the trajectories are higher. Furthermore, the trajectories can be further inwards or outwards, in the first case the shooter should adopt a gun hold position further away from the cabin, while in the second case it should be closer to the cabin.

A further consideration is provided by the weather conditions, with the possible solutions to be adopted for the Trap as follows:

- Shade near the exit area of the target or in case of snow: the shooter needs to slightly raise the eye-barrels system;
- Fog or poor visibility: in this case it is recommended to slightly lower the eye-barrels system;
- Wind blowing forward lifting the targets: the shooter's eye-barrels system needs to be slightly raised;
- Wind blowing from behind pressing the targets: contrary to the previous situation, the shooter's eye-barrels system should be slightly lower.

For the Skeet discipline it is possible to resume as follows:

- Shade near the exit area of the target: the shooter must move the eye-barrels system slightly away from the cabin;
- Fog or poor visibility: the shooter's eye-barrels system must be slightly closer to the cabin.

Last but not least, what can influence the moment when the shooter decides to start the technical gesture is its functional state. More specifically, in the Trap the athlete may experience a condition leading to excessive reactivity or, on the contrary, in a condition leading to poor reactivity: in the first hypothesis the shooter could slightly lower the eye-barrels system or lengthen the stock of the shotgun by a few millimetres, while in the second hypothesis he/she could slightly raise the eye-barrels system or shorten the stock by a few millimetres. This is also possible for the Skeet discipline, although this time in case of excessive reactivity the gun hold position must be moved closer to the cabin, while in case of poor reactivity the gun hold position must be moved away from the cabin. In addition, in the event

of muscle volume variation, it is necessary to check the pitch angle and the height and alignment of the eye on the rib.

In order to be able to determine and keep constant the timing on when to start the movement towards the target without any



change in the technique of the technical gesture, many elements must therefore be taken into consideration. At the same time it is possible to use some useful tools for this purpose. For the Trap, some of these are listed below:

- Choose the reference points in the background;
- Define an area within which the movement can be started by using your fingers or the base of the cartridge or transparent graph paper;
- Change the length of the call;
- Record your timing between the call and firing;
- Use a video recording of your starting movement;
- Use pre-shot routines, identifying and activating the starting keys.

Similarly, for the Skeet:

- Choose the reference points in the background;
- Use a radar to check the speed of the targets;
- Determine the area within which to start the technical gesture using fingers of the hand, trees, stones or a measure;
- Use a video recording of your initial movement;
- Use pre-shot routines, identifying and activating the starting keys.

This section is on ISSF_CoachCourse_PowerpointPresentation.pptx from slide 57 to 74

Practical tasks on the range:

1. After establishing in which area the shooter needs to intervene to improve the initial movement, make the necessary changes
2. Make changes to the shooter's gun holding point to improve initial movement

2. GOOD AND BAD COMPONENTS OF DIFFERENT STYLES

All over the world it is possible to see many different shooting techniques, performed by each shooter and/or school according to their own philosophy of thought and sometimes even within the same school it is possible to identify different shooting styles. For this reason it is possible to distinguish shooting styles only in terms of the techniques used, which can be resumed in the following three for both the Trap and the Skeet discipline:

- Follow Through
- Spot Shooting
- Constant leading

Each of these styles presents good and less good features, knowing them is important to ensure that every athlete can take advantage of their benefits and cope with the difficulties of each style. In particular, it is possible to outline the pros and cons in a few key points for each shooting technique, according to the discipline being practised.

Follow Through in the Trap: good features

- High control of the gun barrels during the movement towards the skeet;
- Easy adjustment for the second shot in case of mistake with the first shot;
- Option to choose different points of the trajectory where to execute the shooting action;
- Synchronous body-gun movement;
- Excellent recoil absorption;
- Better use of peripheral attention that allows to perceive both the gun barrels and the target from the beginning to the end of the movement.

Follow Through in the Trap: bad features

- Long movement to reach the high targets and the 45° angle targets;
- Potential problems if the shooter does not have a well-trained peripheral vision.

Spot Shooting in the Trap: good features

- Short and fast movement with a high gun holding point;
- Narrow rotation angle;

Spot Shooting in the Trap: bad features

- Difficult correcting the second shot in case of mistake with the first shot;
- Shot fired in one area without following the trajectory of the target;
- Risk of loss of the eye-barrels connection during the transition phase;
- Sight picture not always equal;
- Strong recoil in case of wrong movement.

Constant Leading in the Trap: good features

- Good control of the first shot;
- Good control of the barrels during the transition phase;

Constant Leading in the Trap: bad features

- Difficulty in keeping constant the anticipation in the angled targets;
- Risk of loss of low and low-angled targets;
- Difficulty in catching the target with the second shot in case of mistake with the first one;
- Risk of loss of balance during rotation;
- Difficulty in keeping eye-barrels alignment at all times during movement.

Constant Leading in the Skeet: good features

- Better balance;
- Excellent control of both targets;
- More time to locate and catch the second target in the doubles;
- Reduced range of movement for both targets;
- Ease at keeping the same rhythm in all platforms;
- Excellent use of peripheral attention.

Constant Leading in the Skeet: bad features

- Reduced range of movement to end the mounting movement;
- Excellent reaction time required;
- Time to learn to finish the mounting action quickly and always in front of the target on its trajectory.

Spot Shooting in the Skeet: good features

- Excellent visibility and control over the first target;
- High scoring is easy to achieve under standard conditions;
- Excellent use of peripheral attention;

Spot Shooting in the Skeet: bad features

- A long time to learn the technique and preserve it;

- In difficult environmental conditions it becomes challenging making corrections;
- Risk of wrong positioning of the stock on the shoulder during the mounting action;
- Strong recoil in case of wrong gun mounting;
- Risk of anticipating the triggering action.

Follow Through in the Skeet: good features

- Chance to make adjustments in case of bad gun mounting;
- Ease in keeping the same rhythm on both targets in the doubles;
- Excellent recoil absorption;
- Body always aligned with the shotgun.

Follow Through in the Skeet: bad features

- Large range of movement for both the first and second target;
- Difficulty in reaching the second target, for which a greater effort is required.

This section is on ISSF CoachCourse PowerpointPresentation.pptx from slide 75 to 83

Practical tasks on the range:

1. Identify the style used by the shooter and list the pros and cons
2. Considering a Trap shooter who uses the Follow Through style, determine the work to be done to strengthen his shooting technique
3. Considering a Skeet shooter who uses the Constant Leading style, determine the work to be done to strengthen his shooting technique

3. SHOOTING IN DIFFERENT WEATHER CONDITIONS



Clay target shooting is a sport in which the athlete can manage most of the elements characterising its development, even if some of them are beyond his/her control and the shooter can only look for adjustments allowing a better management of the different situations that occur. These include, without doubt, the different weather conditions,

which give a touch of unpredictability to a sport in which it is useful to repeat every little step in the same way. Every shooter must be able to adapt to all types of weather conditions that may occur and for which he/she must be ready to use the necessary precautions:

- *Sunny*: when the weather is sunny you have to pay attention to the position of the sun in relation to the field. In the Trap it may be in front of the shooter, especially when shooting early in the morning, while in the Skeet it may bother the athlete on platform 1, both on the single and double and on platform 8 Mark. In this particular situation, it is recommended to use shooting glasses with lenses ensuring that the sun's brightness is reduced in the face.



- *Partly cloudy*: in this state the light constantly changes, sometimes also when the shooter has to make the call, a complicated situation especially when the background is not homogeneous. The athlete must choose the right glasses, which will highlight the orange colour of the target and improve its



contrast in low light conditions. In addition, the shooter must be able to slightly delay the preparation for shooting if he notices that the visibility is actually constantly changing.

- *Rainy*: when the weather is rainy it is harder to perceive the initial trajectory of the target and the risk of drops on the stock of the shotgun might have an impact on its grip or on the lenses of the glasses with consequent impact on the visual system. The shooter must in any case use the same technique, trying to stay focused only on the execution of the technical gesture; moreover it is necessary to remember to bring all the necessary equipment and to use clothes suitable for the rain, especially in the Skeet discipline where the shooter is more exposed to the weather. Finally, it is recommended not to use shooting glasses, where possible, in order to avoid the discomfort caused by drops on the lenses.



- *Windy*: the wind is one of the most disturbing elements in shooting disciplines, it can blow from different directions and can change or alter the flight path of the target. The athlete must be able to understand the direction of the wind and, if necessary, adjust the gun hold position to compensate for any change in the target's speed and/or change in its flight path.



- *Snowy*: the snow glow is a distracting element for the shooter, who must also take into account the low temperature and the potential troubles in perceiving the exit of the target. For the athlete it may be appropriate to use several layers of warm clothing to mitigate the cold and opt for shooting glasses with dark lenses allowing him/her both to avoid the distraction caused by the snow glow and to highlight the contrast of the target in high light conditions. Using more clothes increases the volume on the area of support of the shotgun, so it is wise to reduce the length of the stock by a few millimeters, as many as those added through the clothes.



- *Foggy*: fog can cause problems in the detection of the entire flight trajectory of the target, so it is fundamental to make the best use of the visual system. Specifically, the shooter must stay focused in order to maintain a state of active vision that allows him to identify the target as soon as possible, adopting a slightly different gun hold position so as to perceive



the target's trajectory first. As soon as the target is perceived, the shooter must be able to perform the technical gesture with the usual timing, moreover it is best to use shooting glasses with lenses highlighting the orange colour of the target and highlighting its contrast even in low light conditions.

- *Hot Towed*: in excessively hot weather conditions the athlete can suffer a direct influence on his/her functional state, so that hydration becomes extremely important. In the event the shooter has to travel to a much warmer place, it is necessary to start to get more hydrated from the moment of arrival and to drink about 3-4 litres of water at least 10 days before the competition, as well as to use light clothing and hats for protection from the heat.

This section is on ISSF_CoachCourse_PowerpointPresentation.pptx from slide 84 to 91

Practical tasks on the range:

1. Instruct the Trap shooter on what to pay attention in case of snow
2. In view of a competition in a very hot place, prepare the athlete and instruct him on all the precautions to be taken

4. CORRECTION OF THE MOST COMMON MISTAKES

Bearing in mind all the features and benefits that the chosen technique offers, it is possible to easily identify the mistakes the shooter can make during the movement phase towards the target. Every single mistake is made for one or more reasons which are the very issues on which to act in order to provide concrete help to the athlete. The types of mistakes made can be very different, but it is possible to list the most common ones and provide possible adjustments for each of them:

- *Anticipating the trajectory reading time at the moment you call the target plate:* an option could be to vary the angular distance between the eye and the line of sight of the rib or to change the gun holding point;
- *Moving towards the direction known on the call in the Trap:* in this case it is appropriate to keep active the use of peripheral awareness, enabling the shooter to wait for the target to pass the waiting point of the barrels or to start slightly late by lengthening the voice during the target's call;
- *Muscles tightened during the call:* this can happen especially in stressful situations. The shooter should make good use of diaphragmatic breathing, in order to better manage stress and to have a good amount of oxygen in the blood and brain, which is fundamental for staying lucid. The call should be short, with the voice volume lowered so as not to put additional strain on the muscles of the body;
- *Arms, shoulders or neck muscles tightened during the movement towards the target:* before the call, the shooter must be sure that the neck muscles are relaxed and should be kept in this state even during the call of the target, so as not to create any muscle tension in the initial phase of the technical gesture. The grip of the hand on the shotgun pistol must be loosened so as to allow the

athlete to perform the movement in a natural way, moreover, the shooter must hold the focus close to the tip of the barrels avoiding a focus in-depth, making the best use of peripheral awareness;

- *Stare at the target while it is running the first few metres after the release:* in this way the shooter loses the perception of the tip of the barrels, so the best option is to keep the active vision state longer and start the movement when the target has passed through the peripheral vision;

- *Make movements of the barrels or the body during the call:* the body is in tension, so the athlete should use diaphragmatic breathing, keep the back and arm muscles relaxed and use a light focus which stays close to the tip of the barrels of the shotgun;

- *Problems in starting the movement or in managing the barrels during the initial movement:* it is necessary to check the balance of the shotgun, considering that generally in the Skeet a back balance of 15-20 grams is adopted, while in the Trap a neutral balance is preferred, even if this balance is very variable according to the type of shooter;

- *Very late or very early start:* the shooter must pay attention to the voice modulation during the call or modify the gun hold position;

- *Narrow hand on the pistol of the stock when starting the movement:* in order to prevent this mistake which leads to a jerky movement toward the target, it is necessary to perform the mounting action by guiding with the arm opposite the arm on the mounting side and keep the finger pressure on the trigger before the call. By doing so, the athlete automatically loosens his hand to avoid an unintentional triggering;

- *Triggering not firm and too soft:* in this case, too, it is necessary to put the fingertip of the finger under pressure on the trigger even before the call and hold the same pressure even during the transition phase towards the target;

- *Finger held too detached or too much pressure on the trigger after the first shot:* to make sure you can get the right position of the finger on the trigger after the first shot you must make a check for the correct position of the hand on the pistol of the stock and/or adjust the distance of the trigger so as to allow the shooter to place the fold between the second and third phalanx exactly on the side of the blade;

- *Early or delayed triggering:* to achieve a stable triggering, it is necessary to keep an active state of vision during the call or adjust the angular distance between the sight and the line of sight of the rib.

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Practical tasks on the range:

1. Considering a Trap shooter who looks clearly the target after a few meters from the exit, describe the difficulties he may encounter and make any changes you deem necessary
2. Considering a Skeet shooter who has problems with the triggering action, define specific exercises to improve this aspect
3. Identify the most common mistakes made by the shooter and make the necessary changes in order of importance

5. TACTICS IN SHOOTING

Tactics play a crucial role in the performance of an athlete, as it involves the management of all those factors which can influence the course of a competition. In fact, all the activities concerning the preparation for the competition can make the difference between a success and a defeat. The coach must think about how the different situations can affect the shooting competition and implement a strategy to allow the athlete to express the best of his/her abilities. To this end, a series of activities must be planned before and during the competition, thanks to them it is possible to train the technical, mental and physical features.

In the period before the competition, in order to increase the shooter's technical skills, it is a recommended practice to carry out specific training sessions, such as for example:

- Training by increasing or decreasing the speed of the targets;
- Training in hard environmental conditions (strong wind, heavy rain, poor visibility, dust, etc.);
- Training in conditions similar to the competition (same throwing machines, same targets, similar background, similar weather conditions);
- Training with different cartridges;
- Training with simulation of the final;
- Shoot-off training;
- Training for different targets.

In addition, sometimes it is useful to prepare a specific training for certain needs, such as specific training on some angled plates in the Trap or platforms in the Skeet or by simulating problems with

microphones or with the perception of the mark in the Trap, for example when it is rainy, or in case of poor visibility of the lights in the cabins in the Skeet discipline.

As far as the mental aspects are concerned, it is necessary to develop a programme for improving the mental control of the athlete in order to achieve a better and specific concentration for the purpose. The training of these abilities can be carried out through some techniques such as imagery, thought control, breath taking, relaxation and balance techniques. In addition, the achievement of



the ideal level of arousal, the increase in self-confidence, positive self-talking and the development of coping strategies must also be addressed. Depending on the competition schedule and on to the period of the year, it is also necessary to set goals for increasing the athlete's physical abilities, in particular endurance, strength, coordination and reactivity. Checking the equipment is the last task to be carried out in the period before

the competition, in order to set it in the best possible way; more specifically, it is appropriate to set the shotgun in all its parts, from the assessment of the type of barrels used to the choice of the best chokes, from the testing of different cartridges to the gun fitting after every possible variation, such as a change in the shooter's weight, returning after an injury or after making some adjustments to the shooting style.

During competitions, instead, the key to achieving the goals is given by the mental strategies and mental strength of the athlete. Unfavourable elements that can affect the shooter's performance are: target parts from nearby fields, audience voices, field failure, referee's tip-off, longer preparation time due to a no-bird, noise produced by other shooters, shotgun out of use, and different weather conditions. In order to train the shooter against possible incidents, the coach has to set up special training sessions, such as for example:

- Throwing empty cartridges or target parts in front of the shooter while he is firing;
- Distracting the shooter with sudden noises;
- Closing the microphone while the shooter is making the target call;
- Training on targets with known trajectories;
- Different number of shooters in the same team;
- Training on different fields;
- Training with different cartridges;
- Simulation of gun or cartridge failure;
- Simulation of interruption of the series.

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Practical tasks on the range:

1. Conduct a training session to improve the shooter's technical skills for a competition
2. Conduct a training session to increase the shooter's mental skills and establish mental strategies for a competition
3. Conduct a training session to increase the shooter's physical skills and make the correct gun fitting for a competition

6. SHOOTING DIARY

The shooting diary is a very useful tool every coach should use as it includes all the necessary information for improving the negative points and strengthening the positive ones, for both the shooter and the coaching skills of the trainer. It is useful to stress that the shooting diary should be written by the coach and the athlete too, in order to make a comparison between some common aspects. The two diaries should follow a slightly different approach, although they should pursue the same goals.

Coaches diary

A coach's diary must include the schedule of the work to be carried out and reviews of both the performance of the athletes and the coaching work done by the coach and his team. By constantly writing down the shooting diary it is possible to remember all the notes and/or observations on everything that is considered important, with no need to mentally memorise everything. The diary must include a section dedicated to the training period and another one dedicated to competitions, also useful for an easier assessment of the sessions carried out. As far as training is concerned, the diary can be considered as a real training session planner, which allows the coach to make a plan of the activities to be carried out on the field, by helping him/her to remember the different stages of the training plan and whether it is progressing effectively or if changes need to be made. All the athletes involved must be included in each section, so that they can be individually identified and the individual progress of each of them

can be assessed; in addition, it is necessary to include which specific training activities are carried out with the athletes, specifying duration, intensity and volume.

In order to develop a more efficient tool, the training part can be outlined in different sections:

- General Training Diary
- Monthly Training Diary
- Daily Training Diary

In the general training diary you will find the schedule of all the periods of the plan; it defines the volume and intensity to be adopted in the different phases and the areas of interest to be improved, such as: maintaining performance, correction of technical problems, improvement of mental routines, stress and competition modes, improvement of technical routines and team building. For each individual area of interest it is necessary to specify a series of exercises that will be used to improve it.

The monthly training diary concerns a more detailed schedule, divided into: weekly training areas, amount of daily training and, finally, specific type of exercises for each training session.

In the last part, relating to the daily training diary, you will find the analysis of the individual training session, which must specify:

- If the given task has been completed;
- Which methods do not work and why;
- Assessment of errors and causes;
- Assessment of the session and technical performance.

More specifically, assessments must be made on all those elements affecting the athlete's performance, i.e. technical, tactical, physical and mental conditions as well as the weather conditions.

At the end of each section you will therefore be able to have a well-defined picture of the positive and negative aspects, thanks to which it is possible to immediately enter the schedule for the following sessions, and to decide the exact time when to make changes and how or, instead, what to do to reinforce what brought benefits to the shooter.

Concerning the part dedicated to competitions, this must be used to list the details of the competition programme and to note down all the shooter's behaviour and the dynamics of each phase. The first frame must specify the goals of the given competition, both in terms of technical performance and result. In addition, it is necessary to take note of the competition patterns, the setting of the targets, the features of the shooting range and make a list of all the aspects that you wish to observe during the competition. This way, during the competition, the coach has the opportunity to include everything he/she considers important in the specific areas and learn a series of tactical information on how the athlete has been able to manage the different situations and understand how all these factors have influenced the performance, both in a positive and negative way.

At the end of the competition the coach must fill in a last section in which should include, for any issue considered necessary, the work to be done in order to improve it before the next competition or the work to be done to maintain the positive components.

In order to develop a diary that can really make a significant contribution to the training methodology, it is necessary:

- Being honest in what you write;
- Take as much time as necessary to write it down;
- Be concise, but without forgetting anything important;
- Record only useful information;
- Write every time you are in the field;

- Create a sample diary before you start;
- Believe in its worthiness;
- Once completed, do not throw it away.

Shooters diary

As previously mentioned, the shooter's diary has the same purpose as the coach's, but with a slightly different setting. The diary is like the personal journey of the athlete, and the main aim is to note down only the most important information that can help the shooter to achieve improvements.

Before writing down, the shooter must add to the diary a copy of the training plan provided by the coach, together with the medium/long-term goals set and the routines developed during training and competitions. At this point it must be drawn up for each single day of training or competition, and the objectives of the session you wish to achieve must be entered first; it is necessary to make a note of the throwing patterns, the setting of the targets, the features of the field, the weather conditions of the day and make a list of all the areas to be analysed. This gives the shooter, at the end of the training session or competition, the opportunity to include all the things he/she considers important in the specific areas and to gain tactical knowledge of how he/she managed the different situations, assessing the performance for each single aspect as previously decided. At the end of the session the last section must be filled, here is where the shooter describes how he/she would like to make changes or improve specific aspects in the following sessions.

Likewise for the coach, in order to develop an efficient and useful diary, the shooter must:

- Be honest in what he writes;
- Evaluate all aspects in a cynical and detached way;
- Be informed about the competition programme and the time schedule of each round;
- Enter the pre-shot routines;
- Enter the goals of each competition, to keep them in mind at all times.

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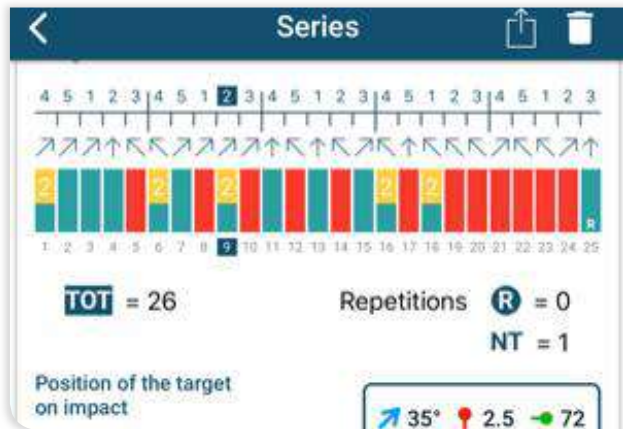
Practical tasks on the range:

1. Write the information in your diary that you find useful during the training session with three shooters
2. At the end of the training session, after having established the aspects to be improved by the shooter, write the work to be done in the following sessions in the appropriate section of the diary

7. USE OF VIDEO EQUIPMENT

A good coach relies on his or her skills and expertise to bring out the best in every athlete who trains and, to do so, it is also necessary to use tools designed to provide very useful information. Among these tools we can certainly include the video equipment, i.e. everything allowing to undertake video-analysis of the athletes' performance. The use of video-analysis tools helps to:

- See technical errors;
- Record visual information related to technique, environment, target trajectory;
- Refresh the athlete's technique;
- Visualize the technical improvements;
- Increase and measure performance;
- Compare measurements related to timing, shooter oscillations or other;
- Increase and measure body activity (heart rate variability).



Slow motion and high resolution recordings allow a clearer understanding of what needs to be improved. The use of specific softwares provides the coach with support to receive easier and more immediate information and statistics on shooters' errors, reaction times or the percentage of broken targets for each

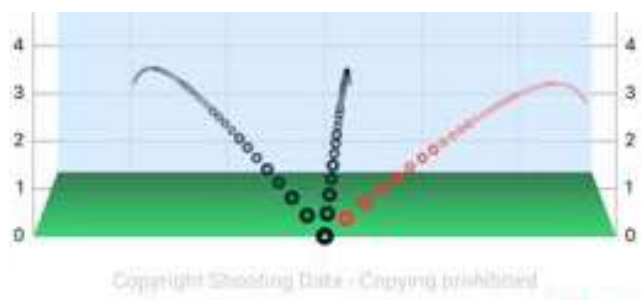
platform and/or launch pattern. Good use of video equipment helps the athletes to be more self-aware during competitions and training.

A summary of the benefits that video equipment brings is given below:

- Qualitative analysis
- Timing analysis
- Help for shooters
- Help for coaches
- Details

Equally, however, it is also necessary to specify some limitations of the video-analysis:

- No three-dimensional movement
- Two-dimensional analysis
- Point of view
- Measurement
- Details (Yes! This could also be a limit, not only an advantage)



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Practical tasks on the range:

1. Make a video analysis of the shooter with the tools at your disposal

8. AMMO TESTING

The cartridges are the tools part of the athlete's equipment used to physically break the target and, for this reason, they are worth special attention; it is therefore essential to be able to identify the best type for each shooter.

To this end, it is crucial to know how to test the ammunition, making the necessary considerations according to different factors:

- Discipline practiced;
- Type of barrels (fixed chokes, adjustable chokes);
- At what distance the shooter fires the first shot and at what distance the second shot;
- The speed of the shooter and the speed of the targets;
- Type of barrels (ecological, pre-break, flash);
- Weather conditions and altitude (effects of humidity and altitude on the shot pattern).

Before moving on to the different steps to follow to test the ammunition, it is advisable to carry out a few preparatory actions, which are useful when assessing the cartridge:

- Decide how to test the ammunition (final simulation, speed of the shooter, find the best shot pattern at station 1 and 7 for the entering targets in the Skeet...);
- Decide at what distance the shot will be fired;

- Decide which chokes will be used, if adjustable chokes are available;
- Choose different brand or type of cartridges (25 or 50 cartridges minimum required for accurate statistics).

At this point we can proceed with the actual test, which can be carried out using a pattern board and/or a software, used by the production companies, providing the technical details of the cartridge.

The pattern board allows to identify the percentage distribution of pellets in the shot pattern, the position of the shot pattern in relation to the centre of the pattern board and the penetration power of the pellets. It is good practice to open 5/10 cartridges to visually assess its quality and the consistency of the powder/lead dosage for the different cartridges; it is also important to check:

- Sphericity and hardness of the pellets;
- Quantity of antimony;
- Type of powder used (progressive, double base...);
- Type of wadding used;
- Penetrating power and energy of the pellets: spruce wood sheets or paraffin sheets are generally used to check the penetrating power of the pellets.

The distance from the pattern board must be:

- In the Trap, 31-32 metres for the first barrel and 35-36 metres for the second barrel;
- In the Skeet, 16-17 metres for the first barrel and 24-25 metres for the second barrel. In the case of testing for the finals, given the existence of inverse double barrels, for the second barrel the distance must be 28-29 metres.

All tests must be repeated at least five times to ensure a reliable result.

The test carried out by the production company is conducted by means of a software connected to a multiple manometer barrel which allows the following measurements:



- *barrel time*: measured in millionths of a second, it shows the time between the contact of the firing pin with the ignition and the exit of the wadding mass - live flying pellets;
- *Speed V1*: (at 1 m) shows the energy of the newly fired cartridge;
- *Speed at 2.5 m*: speed officially adopted to measure pellet ammunition;
- *Pressure value*: expressed in bar;
- *PBO*: (pressure at the brake) the amount of pressure of the propulsive gases left at the end of the barrel
- *Complete*: shows the thrust work carried out by the propulsive gases, therefore the charge of powder;
- *Delay*: time calculated from the moment of ignition, therefore from the explosion of the ignition to reaching 10/100 of the maximum pressure. It shows whether combustion takes place in the correct timing, within the standards.

The examination of all the results collected from the test phase together with the assessment of the technical and morphological features of the shooter will allow the coach to suggest the most suitable type of cartridge, in order to provide the athlete with the very best of every single detail.

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Practical tasks on the range:

1. Make all the necessary tests to choose the best cartridge for the Trap shooter
2. Make all the necessary tests to choose the best cartridge for the Skeet shooter

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