



# Infrared Laser Biathlon Program

Biathlon traditionally combines cross country skiing with small-bore rifle marksmanship, but across the world it has many variations that pair shooting with running, mountain biking, rowing, weight lifting, circuit strength, etc. The Skiku Infrared Laser Biathlon Program focuses on students in 4<sup>th</sup> grade and above and is completely gym-based and flexible so it can be integrated easily into your gym classes. The activities and competitions outlined below only require standard gym clothing for students plus the infrared rifles and a few cones to be used as barriers to separate the shooting area from the rest of the gym.

Infrared laser rifles are a great tool for teaching gun safety and all the necessary fundamentals that are needed to achieve expert marksmanship. With practice anybody can become proficient at handling a biathlon rifle and the drills and games in this handbook will help you and your students along the way.

## Firearms Safety is our Top Priority!

The infrared laser rifles use light instead of bullets and are very accurate. There are a few fundamental rules that all participants must observe. Students should be corrected as part of a normal learning environment. However, repeated safety concerns and/or blatantly disrespecting the process or equipment is unacceptable.

1. **NEVER point a firearm or the laser rifles at people. Laser rifles should only be pointed at targets when they are properly set up on a designated 'range' area and nobody is downrange.** When the guns are not being fired, they must be held with the barrel pointed straight up or laid on the firing line with the barrel pointed downrange. Although the guns are bright colors and don't shoot projectiles, they should always be treated just like you would handle any other firearm.
2. **Only put your finger on the trigger when the gun is pointed downrange and you are ready to fire.**
3. **The bolt remains open until the laser rifle is pointed downrange and you are ready to fire.** It's a good habit to leave the bolt back so that you practice the loading sequence
4. **Once the laser rifle range is set up, only coaches should go downrange and only when no one is shooting.**

# Setting up the Infrared Laser Rifle Range

To set up the laser rifles, you'll need a section of the gym about 40 feet long and 20 feet wide. The best location is a corner area because it naturally restricts the foot traffic around the shooting area. Place the rifles on the 'firing line' so that they face a wall and won't have anyone trying to run through the line of fire. Proper setup is VERY IMPORTANT because this helps reinforce safe behavior and protects the laser rifles.



1. **AN ADULT MUST BE PRESENT TO OVERSEE ALL LASER RIFLE SESSIONS**, from set-up to take-down. DO NOT leave students unsupervised with the laser rifles because this leads to unnecessary horseplay.
2. Clearly define the shooting area and firing line with cones or other markers. To keep basketballs and other items away from the shooters, guns, and targets. It's ideal to use half the gym for shooting and shooting-related activities.
3. Make sure that everyone in the gym understands where the shooting area is and what is expected of them so that nobody chases balls or other wayward items into the firing area.
4. The rifles should be placed 20-30 feet from the targets to ensure optimal operation. Too close and the site picture will be off. Too far away and the system won't operate properly.
5. Always place the target boxes near a wall so that there is a natural 'backdrop' for shooting and to reduce the chance of someone running 'around' the shooting area. It is best if the target backdrop is white or another light color. This makes it easier for shooters to see the targets while aiming.
6. Place target boxes securely on the ground for or another stable surface (when shooting standing) so they don't fall and get broken.
7. Place the gun cases on the firing line so they can be used by shooters as a rifle rest.
8. **Remember, a safe environment that encourages respect for the shooters and equipment is our primary goal!**

# Rifle Basics

This section highlights the main components of rifle biathlon shooting. That includes the following items:

1. Safety
2. Eye/Hand dominance
3. Positioning
4. Sight picture
5. Sight alignment
6. Breath control
7. Trigger squeeze
8. Follow through

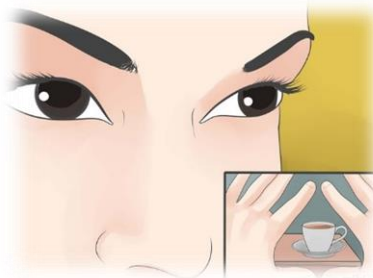
1. **Review the safety protocol on page 1**. This is always the first thing that new students should learn and it's important to go over these rules with shooters before every shooting session and reinforce them as needed.
2. **Right hand vs Left hand** – most students will express a strong preference for shooting right or left handed. A few won't be sure. In that case, you can help them choose which side to shoot on by checking their EYE DOMINANCE. Every athlete has one eye that is dominant and that will dictate which side they should shoot on. Eye dominance is almost always more important than handedness. To check for eye dominance, use WikiHow's quick 5-step guide:
  - **Hold your hands at arm's length out in front of you.** Your palms should be pointing forward - in other words, you should be looking at the backs of your hands.
  - **Make a "triangle."** Extend both of your thumbs so that they're roughly perpendicular to the rest of the hand. Overlap your hands so that the space between makes a triangle. Your two thumbs should be at the bottom of the triangle, while the edge and index finger of each hand form the two remaining sides.
    - The triangle space between your hands acts as a viewing window - you should be able to clearly see objects through it.



- **Look at an object through the triangle hole made by your hands with both eyes open.** Find a nearby object that's small enough (or far enough away) that you can see the whole object through the viewing window between your hands. This can be anything - a door knob, a basketball hoop or another object that's a ways away.



- **Focus on the object.** Try to focus your eyes on the object between your hands - not your hands themselves. Your hands should become somewhat blurry, while the object remains clear and in-focus. It's important to line this object up directly in front of you and to stare straight at it - turning your head to either side can distort your results.
  - For best results, at this point, make minor adjustments to your hands so that the object you're looking at fits almost exactly within the edges your viewing window. In other words, if your triangle is bigger than the object you're looking at, move your hands together to make it smaller, and vice versa.



- **Alternate closing each eye to see which gives better vision.** Close one eye, then open it and close the other. Each time you switch eyes, the object you're looking at should do one of two things. It should either become obscured behind one of your hands *or* remain visible. Next, try your other eye. Your dominant eye is the one that allows you to see the object while it remains open.
  - In other words, if you close your left eye and the object jumps out of your vision, but you close your right eye and the object stays stationary, your **left eye** is your dominant eye.

### 3. **Basic Body Positioning**

- When you get into prone (lying down) shooting position, you will be on your stomach, with your body angled a little to the left of the line to the target, as shown in the picture below. (This assumes you are right-handed.) Your spine should be straight and shoulders square with your spine. Your legs should be comfortably spread in a "V."



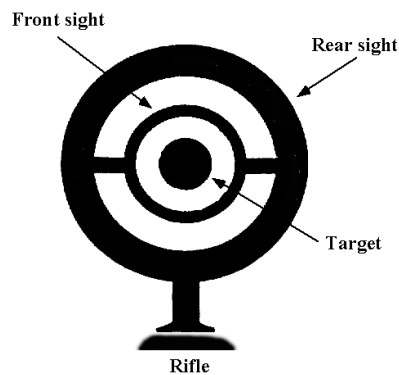
### 4. **Sight Picture**

- Biathlon rifles use a "peep" sight. For right handed shooters, place your right cheek firmly on the cheek piece with your 'dominant' eye positioned directly behind the rear sight and roughly an inch or two back from the eyecup as shown.





- Line up the sights and target so that they form concentric circles with the front and rear sights, as shown in this stylized peep sight.



#### 5. **Breath Control**

- Take deep relaxed breaths while you're getting set up; don't hold your breath or hyperventilate. When you are ready to shoot, exhale to the natural 'bottom' of your breath, pause on the target, and squeeze the trigger.

#### 6. **Trigger Squeeze**

- When you fire, gently squeeze the trigger. Do not jerk.

#### 7. **Follow Through**

- Once you squeeze the trigger, keep the barrel pointed at the target for a short interval. This helps you hit the target consistently.



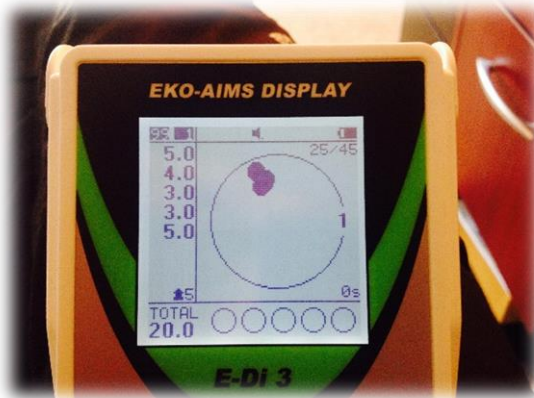
# Zeroing an Infrared Laser Rifle

It's important that rifles are zeroed before each session and/or when the distance between target and rifle are changed. The zeroing process confirms that the gun sights are properly aligned with the barrel so that shots hit where the shooter intends them to. Follow the steps below to quickly zero the rifles.

1. Have an experienced shooter take 5 consistent shots off a prone rest.
2. Look at the location of the 'group' on the computer monitor. If it is in the center of the target, take 5 more shots to confirm.
3. If the first group is not centered, you will adjust the target using the windage (Left/Right) and elevation (Up/Down) dials located on the rear sight.



4. First decide which direction your group needs to move in order to be centered. In the group below, you need to move DOWN and RIGHT.

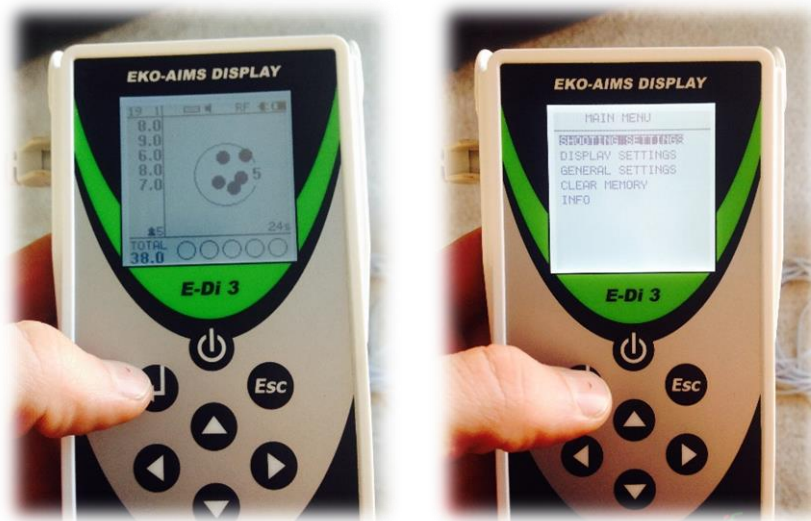


5. Make an adjustment. In this case the rough adjustment would be 10 clicks DOWN and 5 RIGHT. Shoot again.
6. Repeat this process until the group is relatively centered and then you can begin games or competitions.

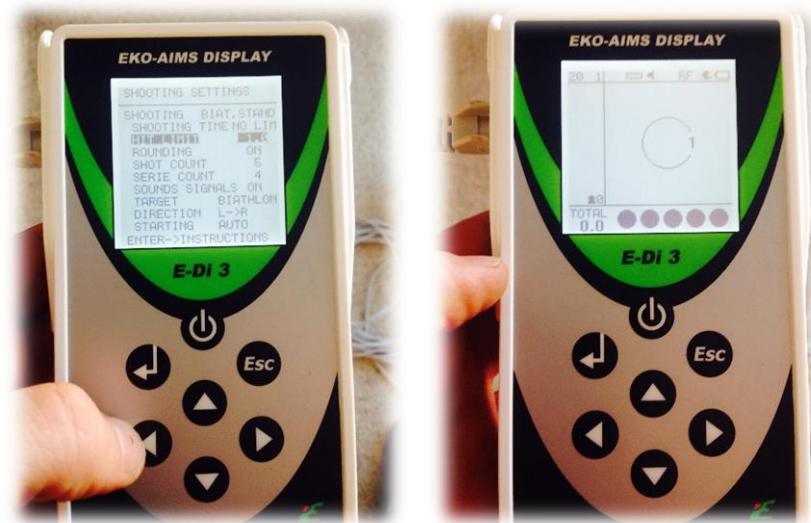
## Adjusting Target Size

The computer automatically detects and adjusts for how far away the target is from the rifle, keeping the relative size of the target constant. However, it is possible to adjust the target size larger or smaller to force shooters to be more accurate or to set an easier mark for newer shooters. Target size is in a range between 1 (largest) and 10 (smallest). In the image below the target is set to 5. To adjust target size:

1. Push the 'back' arrow to expose the menu and then hit the 'back' arrow again to expose the 'Shooting Settings.'



2. Scroll down to 'Hit Limit' and then use the left and right arrows to adjust target size. When you have scrolled to the correct size, hit the 'ESC' button twice to return to the main shooting menu.





# Training Activities

Once the shooting area is set up and the gun(s) have been zeroed, you are ready to shoot. Choose from the drills, games, and competitions below.

1. **Repetitive shooting exercises** – have students get in a line and rotate through the gun(s) shooting 5 shots each. They can work on smooth trigger squeeze, consistent breathing, and follow through. After each set of shots, they can take a quick look at the screen to see where their shots hit the target.
2. **Wind sprints & shooting** – Students take turns running the length of the gym or sprinting around the baselines if space allows and then they shoot five shots. This gets the heart rate up and makes shooting more challenging.
3. **Alternating free throws & shooting** – Combine two shooting exercises. Variations are listed below.
  - a. Alternate one shot of each
  - b. Alternate five shots of each
  - c. Add 'penalties' for missed shots, like 5 push-ups, burpees, or sit-ups per miss.
4. **Obstacle course with core** – Setup an obstacle course around the gym using foot drills, core exercises, agility drills, tumbling (if you have mats), etc. Students race to complete the course and then have to make 5 shots at the end.
  - a. Add penalties for misses
5. **Relay competitions**
  - a. Pick teams and have them decide order and a team name
  - b. Set a course (either running or obstacle)
  - c. Define a tag zone – usually team members just tag hands after each shooting
  - d. Say go!



6. **Races** – standardized race that can be done for time and compared between different groups, classes, and even schools. The standard course loop is around the baselines of the basketball court. A couple variations are listed below.
- a. **Sprint Format** – 2 shooting stages and 3 running stages
    - i. Run three laps around baselines
    - ii. Shoot 5 shots
      - 1. 5 push-ups, burpees, or sit-ups per miss
    - iii. Run three laps around baselines
    - iv. Shoot 5 shots
      - 1. 5 push-ups, burpees, or sit-ups per miss
    - v. Run three laps around baselines to finish
  - b. **Pursuit Format** – 4 shooting stages and 5 running stages
    - i. Run three laps around baselines
    - ii. Shoot 5 shots
      - 1. 5 push-ups, burpees, or sit-ups per miss
    - iii. Run three laps around baselines
      - 1. Shoot 5 shots5 push-ups, burpees, or sit-ups per miss
    - iv. Run three laps around baselines
    - v. Shoot 5 shots
      - 1. 5 push-ups, burpees, or sit-ups per miss
    - vi. Run three laps around baselines
    - vii. Shoot 5 shots
      - 1. 5 push-ups, burpees, or sit-ups per miss
    - viii. Run three laps around baselines

## Storage, Charging, Turning Devices On & Adjustment

Each infrared laser system comes complete with a heavy duty case to protect the electronics and all the necessary equipment to charge the computer, target boxes and rifle.

1. **Storage** - There is a designated space for each component. Return all items to their proper locations after each use and place the case in a locked storage area!



2. **Charging & Powering On** – The target box, handheld computer, and rifle must be charged in order to function properly. Consult the photos below to see how to connect the various components.
- a. Target box - charged via a black power box. It also connects via long, white cord to the handheld computer. Turn on via switch on the side.
  - b. Handheld computer – can be charged via black power box or by being plugged into target box. You can also charge the rifle using a cord that connects from the handheld computer to the rifle. Turn on via power button, top and center.



- c. Rifle – powered via cord from handheld computer or plugged into USB wall socket (not included). Turn on via button on the left side of the rifle.



3. **Rifle Adjustment** – The rifle cheek piece and butt plate on the stock can be easily adjusted by loosening the associated screws with the included allen key.