



## The "A" Team's method of Parallax Adjustment and Scope Preparation

We have seen scope instructions from manufacturers that leave the scope improperly adjusted in regards to parallax. Focusing at a white wall or the sky until the cross hairs are in focus just doesn't cut it. Everyone says to make sure you have the parallax adjusted properly but no one explains how to do it. We will not explain what parallax error is here. That can be found at numerous sources on the web. What this article explains is a procedure that we developed to prepare our scopes for use on our airguns. This procedure will get the scope Parallax Error Free for the one individual that it is set for. Each individual's eyes are different so one universal setting will not work properly for all shooters. More on that is covered below.

**NOTE:** this procedure is dependant on visual cues you will receive from the scope as you are performing it. There is a communication between you and the scope. You are giving the scope commands by changing the Objective and Ocular adjustments and the scope is feeding information back to your brain via your eye and the optic nerve. You will not be able to understand this procedure without the feedback from the scope while doing the procedure. So if you don't understand what is going on here it is because you have not done the procedure and had the benefit of the scope communicating with you. If you are an individual who knows about scopes, or thinks they know about scopes, then it is also likely that you will be reading into the procedure and thinking it means "this and that" instead of reading what is there exactly and following it while you are adjusting the scope per procedure instructions. This procedure can be explained in about 4 sentences but has grown long to alleviate the problems of people reading into it instead of reading and doing it step by step.

**Caution:** This procedure is designed for scopes with an Adjustable Objective (AO). If you are trying to perform this on a fixed objective scope you will get very confused. Although this procedure will work on all Adjustable Objective scopes it has been found that scopes with low magnification (set less than 18 power) do not feed back enough information to the shooter's eye for this procedure to be able to work consistently because the shooter won't SEE the information that the scope is sending you. It is mandatory that you can see small changes made to the scope and low power scopes and scopes with large depths of field do NOT give you the feed back required to set it up correctly. This procedure works best with scopes of at least 18X (preferably 24X to 36X and above, as used in Field Target competitions) and have a narrow depth of field.

A new scope will not get mounted on a gun until we have properly adjusted and calibrated it. Adjusting the scope is explained in Procedure 1 and Calibrating the scope is explained in Procedure 2. You can not do procedure 2 correctly if procedure 1 is not done and correct.

Disregard all manufacturers distance markings on the objective of the scope. Procedure 2 will calibrate the

objective with correct marks. The ones from the manufacturer are rarely marked correctly and some are only marked correctly in one or 2 spots but not all. There are scopes that are marked correctly but they are few and far between. Even the \$1000 scopes we use in Field Target are usually marked wrong from the manufacturer.

## **PROCEDURE ONE:**

**1)** We have found that it is best to focus in at 11 yards at the highest magnification setting the scope will allow. If your scope does not parallax adjust down to 10 yards then choose 1 to 5 yards more than the scope is supposed to be able to adjust down to. If you use a rubber Eye-Cup, remove it for these tests. Set your scope in a V- block that is mounted on a tripod, or sandbag your scope mounted gun so that it won't move. Use a tape measure and place your target at the exact specified distance from the front of the objective of your scope. Aim the cross hairs at the target. For a target use grid paper, a newspaper or something with fine lines that you can still make out while you are looking through the scope.

Steps 2 and 3 are to initially check the scope setup:

**2)** Adjust the parallax ring (front objective or side wheel) until the **target grid paper from step 1 is in focus**. The crosshairs may not be in focus at this time. (Keep in mind that if the crosshairs are welded to the target during the "Head Bop" (explained in 3 below) and the target is in focus, then the crosshairs should be in focus.)

**3)** Now without touching the scope (or what is supporting it) look through the eyepiece and move your head around, (we call this the "Head Bop"). If the center of the crosshairs stays exactly on the target while you are moving your head, then the ocular focus adjustment is correct and the scope is parallax error free when ever the target is in focus. (If that is the case then you may go to Note 1 below and then to Procedure 2). **Remember that the target must be in the sharpest focus possible during these tests.** If the center of the cross hair moves (even slightly) then you must adjust the eyepiece (Ocular Lens Adjustment).

Step 4 is to adjust the eyepiece (ocular adjustment)

**4)** The eyepiece adjustment will allow you to dial out parallax errors, which will be indicated by the target being in focus. Adjust the objective of the scope until the center of the cross hair is welded on the target. Do the "Head Bop" to confirm this. (The Target and the crosshairs may not be in focus at this time.) If your scope's Ocular (eye piece) adjustment has a locking ring then unlock it now. (If your scope has a quick focus eye piece then disregard comments made to locking the eye piece adjustment ring/collar. After finding the correct setting on a quick focus eye piece scope we always use a piece of black electrical tape wrapped around the quick focus ring to "Lock" the quick focus ring in place.) **Then adjust the eyepiece (ocular adjustment) until the target is in focus without moving the object adjustment.** Now lock the eyepiece adjustment with the locking collar.

Step 5 is to confirm that the eyepiece (ocular adjustment) is correct after a change has been made.

**5)** Take a break and rest your eyes for a few minutes. Time to re-check the settings. Rotate the front of the objective all the way to the infinity mark and then "focus" the front of the scope (parallax adjustment ring) until **the target is in the sharpest focus** (always move the objective end of the scope quickly to prevent your eyes from trying to compensate for an out of focus situation and fooling you). Always finish the rotation of the front of your scope in the same direction (I.E. always go from near to far or from far to near). Now do the "Head Bop" to see if the center of the cross hair is welded on the target. If it is, you are done with the eyepiece adjustment and you can go to Note 1 below and then Procedure 2.

**6)** If not, unlock the eyepiece locking collar; make a small adjustment to the eyepiece, and relock the collar. Again, rest your eyes for a few minutes. Then go back to step 2 and repeat the process until the scope passes the tests in steps 3 and 5.

**Note 1:** Remember there is a fine balance between the ocular adjustment and the objective parallax adjustment ring. Once you are finally done with the ocular adjustment you can then go to Procedure 2. Keep in mind that the scope is now set to be parallax error free when ever you have the target in proper focus. Another shooter will focus differently on a target with your scope so for anyone else the scope will not necessarily be parallax free. It is set for your eyes with your glasses. If you use shooting glasses then these procedures should be done with your shooting glasses/reading glasses on exactly the same way you will use your scope in the field.

**PROCEDURE TWO** is to check the yardage marks on the front of your scope in reference to the correctly adjusted focusing of your scope. **DO NOT ADJUST THE EYEPIECE ADJUSTMENT DURING PROCEDURE 2. IF THE EYEPIECE APPEARS TO NEED ADJUSTING THEN GO BACK AND REPEAT PROCEDURE 1 ABOVE.**

**1)** You will have to decide whether you will add distance marks to the front of your scope or to replace all of the existing distance marks. If replacing all of your marks then fasten a piece of paper via double stick tape, or use White vinyl tape, and fasten it over the distance marks on the objective of your scope. You may need to be creative with the manner of fastening it as some scopes have a bevel where the Objective distance marks are. Sticking tape to the bevel and having it line up straight is tricky and will have to be achieved by trial and error. Some people also just use small back sticky numbers to stick to the objective during this procedure. It is the users choice as to the method. We have had great success with the white vinyl tape method.

**2)** Setup your equipment as in Procedure 1, step 1 above. You will be focusing in on targets at different distances ranging from 10 to 55 yards so make sure you have this available to you as you are setting up your equipment

**3)** Focus in at a target at 20 yards and then read and mark the objective end of the scope with a 20 in line with the indicator that is factory marked on the front of the scope adjacent to the objective distance marking area. If you are adding or verifying factory marks you will probably notice that the yardage mark on the scope is off. I have seen them off by as much as 5 yards.

**4)** Now go back to step 3 and repeat at 10, 30, 40 and 50 yards. Repeat step 3 for as many distances as you want marked on the front of your scope. We mark the scope in 1-yard increments from 9 to 40 yards, then to 55 yards by 3 or 5-yard increments depending on the scope being calibrated.

**5)** Final step. Cover the new Objective distance scale that you just created with clear packing tape to protect it from weather and finger smudges. This will take some finesse but it is once again a trial and error type of fit.

**Regarding step 3** you will probably notice that all of the factory yardage marks were off. I only have one scope that has ever been on and didn't need re-calibrating of all of the distances on the objective end of the scope. Check every yardage and make corrections as you go. You can also do the "Head Bop" to confirm the hairy ones.

**NOTE 2:** The eyepiece adjustment may need to be changed occasionally as your eyes gradually change. Once you have all of the corrected yardage marks on the front of the scope (by completing Procedure 2) then

adjusting the eyepiece (via Procedure 1) will bring these calibrations back into spec. The eyepiece adjustment is usually the most important adjustment and is the reason why one person may have trouble shooting someone else's gun. No two people's eyes match 100% and this is why you must adjust the scope for yourself (via Procedure 1). Once the correct yardage marks are on the scope then they will not change but the eyepiece adjustment may need to be changed occasionally. If another shooter will be using your scope for an extended period of time you can adjust the eyepiece (via Procedure 1) so that the scope will be "set" for that shooter and the yardage marks will then be correct for them.

**Summary: If you follow the above guidelines then when you focus on a target (Range Find) with the objective of the scope you will also be parallax free and know the correct distance to a target all at the same time.** We normally take from three to four hours preparing a scope to be mounted on a gun. We mark the scope in 1-yard increments from 9 to 40 yards, then to 55 yards by 3 or 5-yard increments depending on the scope being calibrated. Until it is setup properly there is no reason to trust it in competition. This is one of the major reasons that a shooter will miss a target. If you think it's at a distance and shoot it as you believe you may be just rolling the dice as to whether it will go down or not. The parallax could be off and the yardage markings could be off as well. That leaves you with two disadvantages when it comes to putting your pellet on target.

When you are finally done all that remains is to attach your favorite scope knob (available from a few sources including The "A" Team - [Products and Technical info page](#)) and shoot in your different distances. If you are using a trajectory program, we use and recommend **ATEAB**, (the "A" Team Easy Airgun Ballistics program - [ATEAB Program page](#)), then you will be glad that you corrected the yardage marks up front. If the yardages were off there would obviously be no way to use a mathematical approach to trajectories.

Hope this helps you keep your pellets in the kill zone.

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