

# Scope Performance TriAngle #2

Balancing the Triangle of: **High Magnification vs. Brightness vs. Long Depth of Field for Less Parallax**

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**Balance your priorities – since you can get only 1 or 2 of the 3 sides of the triangle**

**3 Components: If you increase 1 you decrease the other 2 (usually)**



## Explanation

A **long depth of field (DoF)** provides a longer stretch (“field”) where the *image sharpness* and the *parallax error* are well enough adjusted. (The **DoF** could also be called the **SPR** = the *sharpness and parallax range* – since it is kind of similar to the *point blank range*, PBR, which is the stretch where the point of impact is well enough adjusted to hit inside the kill zone.)

**Importance of a long DoF (SPR):** It allows for quicker shots because the side parallax turret or adjustable objective (AO) do not have to be adjusted as often as long as the quarry is within the **DoF (SPR)**. The closer the *range*, the shorter the **DoF (SPR)**– in other words the closer the range the quicker *sharpness* and *parallax* adjustment will

be off. E.g., a moving target will leave the DoF (SPR) quicker, requiring an adjustment.

The trade-offs: • *To get a longer DoF* usually results in less brightness (through smaller objective lens diameter) and/or reducing the magnification. • *To get more scope image brightness* usually results in a shorter DoF and/or reducing the magnification. • *To get more magnification* usually results in a shorter DoF and/or in less brightness.

**Brightness:** Useful for low light shooting and scope cam filming. A larger objective lens diameter increases brightness, but also with better lens coatings and better optical engineering (=expensive) (all other things equal).

## Remedies for the Lack of High Magnification

**(A) For high magnification to see better in general:**

- Get an eye operation.
- Get glasses/ contact lenses.
- Get a scope with clear glass (could cost \$\$).

**(B) For high magnification to see quarry better:**

- Learn the art of stalk hunting and get closer to your quarry. Build better hides for closer ambush hunting.

**(C) For high magnification to spot your hits on paper targets:**

- Use splatter targets (commercial/ DIY).
- Stop using target cards with large black bulls’ eyes that make hits hard to see.
- Shine bright lights onto targets.
- Use a spotting scope (\$300–1000) on a tripod (\$40–100).
- Use a camera with a powerful tele zoom. Take a photo, and review your hits on the camera’s viewing screen.
- Shoot a larger caliber.

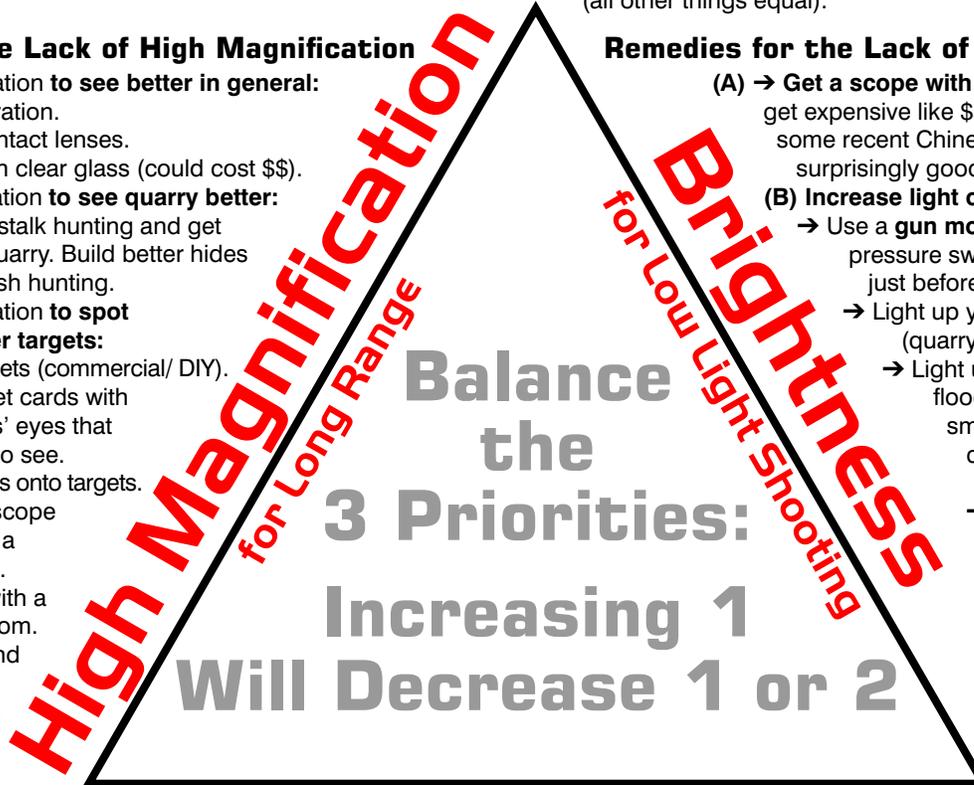
## Remedies for the Lack of Brightness

**(A) → Get a scope with good glass quality** (which can get expensive like \$500, 1000, or 1500 – however some recent Chinese products can have surprisingly good glass).

**(B) Increase light on target:**

- Use a **gun mounted flashlight**, maybe with a pressure switch to conveniently turn it on just before pulling the trigger.
- Light up your **baiting area** with red lights (quarry will get used to it after a while).
- Light up the **barn** with some LED floodlights (late models are as small as a cell phone, and one charge gives several hours of bright light for less than \$50).
- **For target shooting** shine one or more flashlights or LED floodlights onto your target.

**(C) For scope cam filming:** Reduce frames-per-second (e.g., from 60fps to 15fps)



# Long Depth of Field (DoF)

for a Longer Stretch where Sharpness and Parallax Are Well Adjusted

DoF could also be called SPR = Sharpness and Parallax Range

## Remedies for the Lack of a Long Depth of Field (DoF, or SPR)

**(A) To remedy parallax error when quarry is outside the DoF, i.e. outside the sharpness and parallax range (SPR):**

- Find a good cheek weld and practice consistent eye placement; the more consistent, the less parallax error.

**(B) To remedy sharpness/ parallax error when quarry is outside the DoF (i.e. SPR):**

- For very close shots that require quick action, use additional sights that are zeroed at close range: laser sights (\$20–100), red

dot sights (\$40–200), or open sights. Mounting: angled mount on rail, or top of scope, airtube, or forestock.

**(C) To make adjusting parallax/ sharpness easier:**

- Get a scope with *side* parallax instead of *front* parallax (AO).
- Get a side wheel to mount on the side parallax.
- Learn to estimate the range and quickly pre-set the parallax to that range before raising the gun and taking the shot (a calibrated range tape on the parallax turret helps).