



Zero The Rifle Combat Optic (RCO)





OVERVIEW



- **CHARACTERISTICS**
- **NOMENCLATURE**
- **MAINTENANCE**
- **MOUNTING**
- **EMPLOYMENT**
- **RCO ZEROING**





CHARACTERISTICS



- The AN/PVQ-31A (AN/PVQ-31B) (RCO) is, the official US Marine Corps designation for the Trijicon TA31RCO-A4, known as the Advanced Combat Optical Gun sight (ACOG).
- Mounted on the M16-A2, M16-A4





CHARACTERISTICS



- **Provides the shooter:** Quick target acquisition at close combat ranges.
- Enhanced target identification and hit probability out to 800 meters, utilizing the Bullet Drop Compensator.



CHARACTERISTICS



- Dual-illumination technology:
 - Combination of fiber optics and self-luminous tritium, allows the sight to be continuously illuminated without the use of batteries.
- Aiming point will illuminate in total darkness
- Fiber-optic self-adjusts reticule brightness during daylight according to ambient light conditions

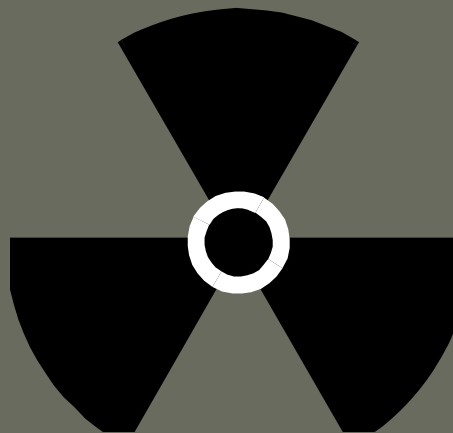


CHARACTERISTICS



WARNING

- RADIOACTIVE MATERIALS
- RADIATION HAZARD
- SAFETY PRECAUTIONS





SPECIFICATIONS



- Objective Lens 32mm
- Magnification 4 power
- Eye Relief 1.5 in
- Field of View 36.7 ft @ 100 yards
- Length 5.8 in
- Weight 15.3 oz w/ mount



SPECIFICATIONS



- Waterproof 66 ft
- Tritium Useful up to 15 years
- Range Up to 800m optimal
- Disassembly Strictly prohibited





NOMENCLATURE



Controls & Indicators:





IDENTIFICATION





IDENTIFICATION



Left side-
National Stock Number (NSN)

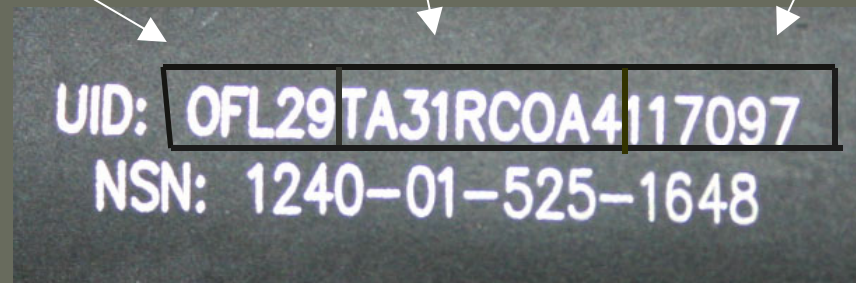


Right side-
Model number

Cage Code

Model

Serial Number

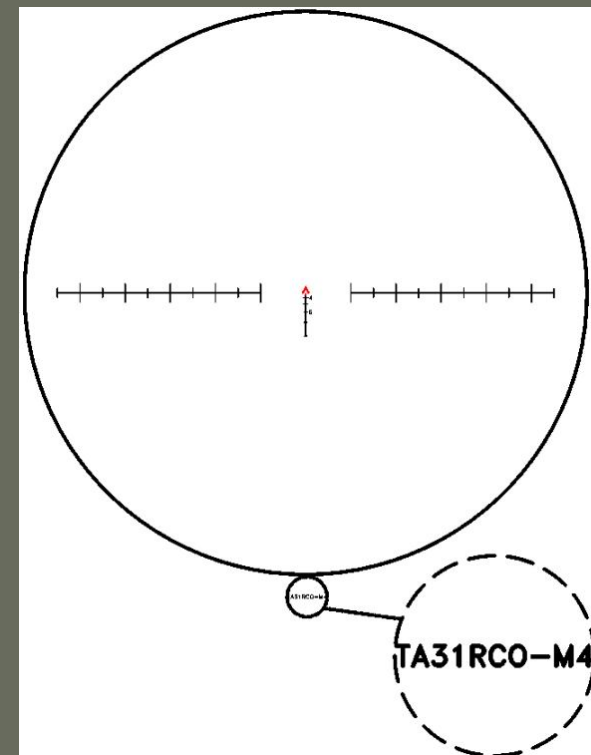
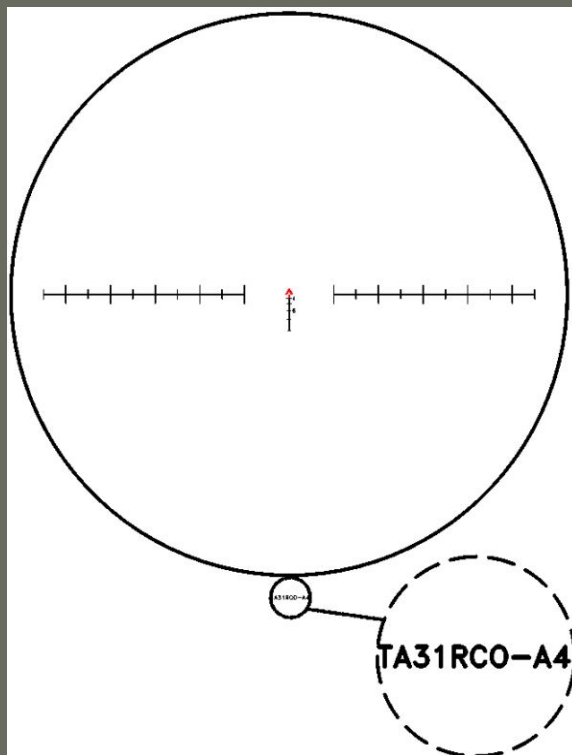




IDENTIFICATION



- The model type will be noted at the bottom of the Field of View when looking into the optic.







MAINTENANCE



Inspection:

- Tritium lamp
 - Check prior to deployment of the optic
- Every six months or immediately following any incident which might lead to lamp failure, such as the dropping of the AN/PVQ-31A (RCO) onto a hard surface
- Determine if tritium lamp is functioning
 - Enter a dark room and look through the optic
 - The Chevron should be illuminated red.
- Reticule does not appear to illuminate in the dark
 - Contact your unit maintainer for confirmation and disposal



MAINTENANCE



Inspection:

Small bubbles or milky lines are acceptable and will not alter the performance of the optic



Trace amounts of silicone may be visible and are considered normal. This will not affect the performance of the optic

MAINTENANCE

Cleaning the AN/PVQ-31A (RCO):

- It is recommended that clean water be used to rinse foreign material from the external surfaces and lenses.
- Soapy water is better but, rarely available in the field.
- If water is unavailable, the AN/PVQ-31A(RCO) comes with a cleaning tool (Lens Pen) that does not require the use of water.





MAINTENANCE



- If fresh water is not available, utilize Lens Pen to remove all foreign material from the unit
- Pay special attention to the lenses
 - ALL foreign material must be removed before continuing
- Remove the cap to expose the Felt Lens Cleaner
 - Ensure there is NO foreign material on the felt surface
 - Starting in the center of the lens press the felt surface of the lens cleaner against the lens and in a spiral motion, work from the center to the outside edge of the lens.
 - Repeat if necessary.



MAINTENANCE



Do Not:

- Use any type of solvent on the AN/PVQ-31A (RCO).
- Use non-prescribed tools in an attempt to “break down” the AN/PVQ-31A (RCO).
- Use anything other than water, soap, and/or the Lens Pen to maintain the AN/PVQ-31 (RCO).
- DO NOT DISASSEMBLE the AN/PVQ-31A (RCO)





MOUNTING



Installation: Rail

The AN/PVQ-31A(RCO) can be placed in any of the slots on top of the receiver to allow for eye relief adjustment. Once the ideal position has been determined, apply forward pressure on the optic and tighten the knobs using finger pressure only. Then, add another $\frac{1}{4}$ turn utilizing a coin or bladed screwdriver.



Mark Thumb Screw location with permanent marker or other means.

Caution: DO NOT tighten beyond this recommended method.



MOUNTING



Carrying handle:

Align the forward mounting hole with the carrying handle mounting hole. Once properly aligned, seat the optic into the carrying handle channel ensuring the hole alignment is retained. Placing the optic into the carrying handle may require substantial pressure. Use hands only. Do not use impact.





MOUNTING



Carrying handle:

CAUTION: alignment is crucial. **DO NOT** force screw set into the threaded hole of the optic. Damage will occur to the special threads. If resistance is met, check optic/carry handle alignment and try again.

Special washer



Lock washer





MOUNTING



Carrying handle

U shape fits under the handle against the curved surface. Using maximum finger pressure only, to tighten the screw.

CORRECT



INCORRECT



Not seated correctly

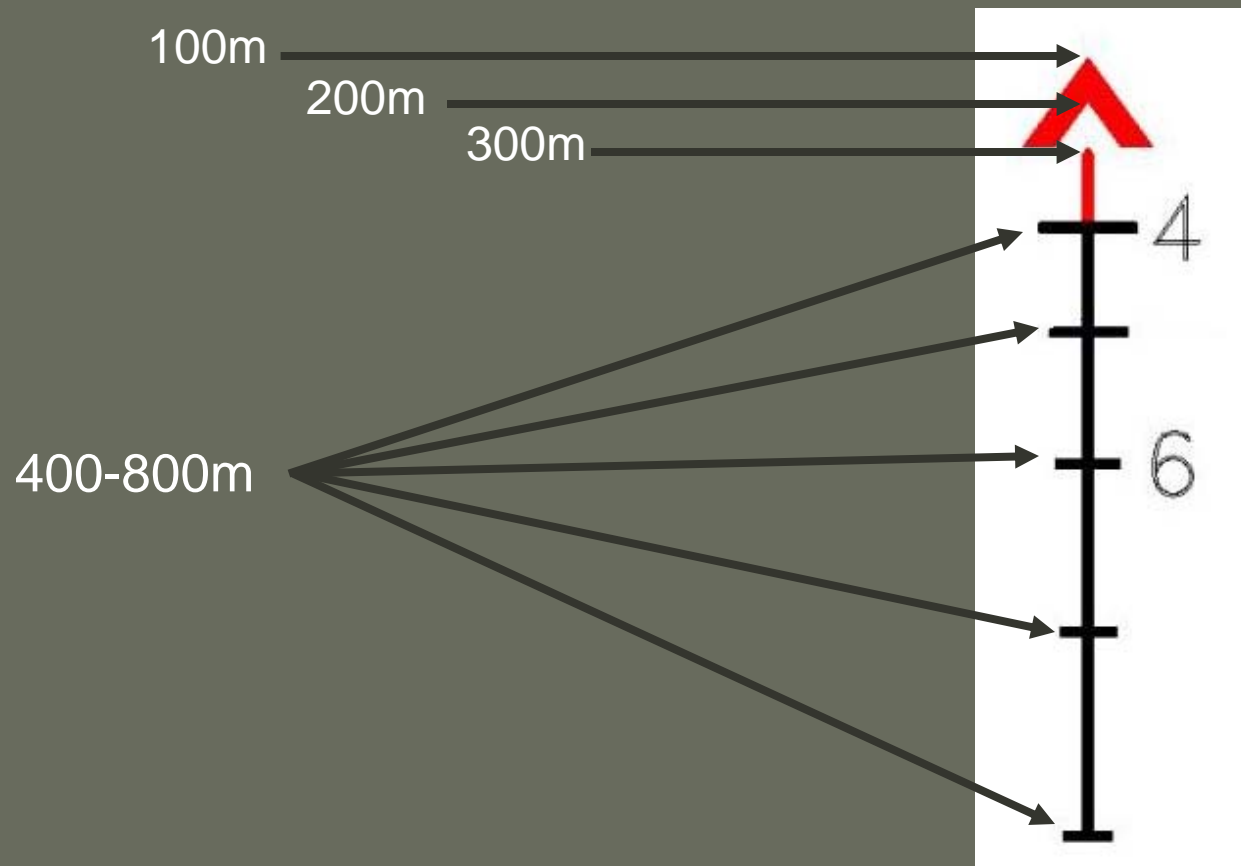




EMPLOYMENT



Bullet Drop Compensator (BDC) Points of Impact:





EMPLOYMENT



Ranging Capability:

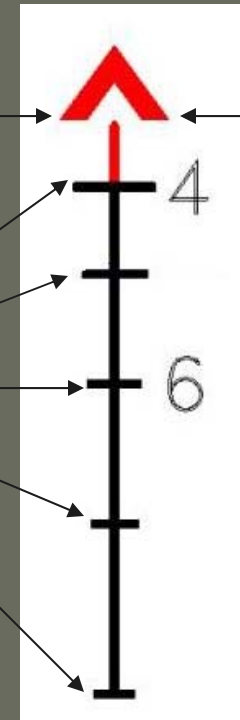
The base of the chevron and the horizontal stadia lines represent 19 inches at the respective range, (average width of a man's shoulders). Range your target using the chevron and the width of the stadia lines.



19" @ 300m

Base

19" @ this distance

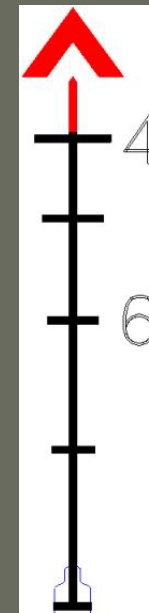
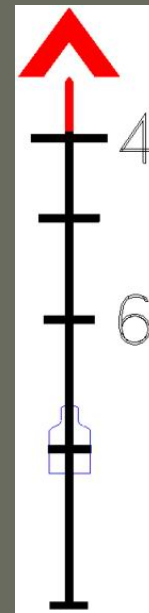
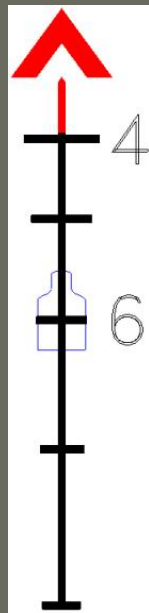
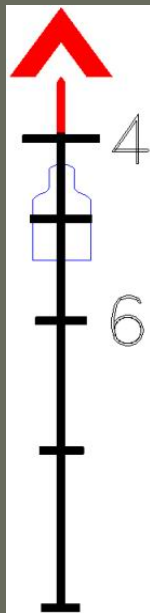




EMPLOYMENT



Ranging Capability:



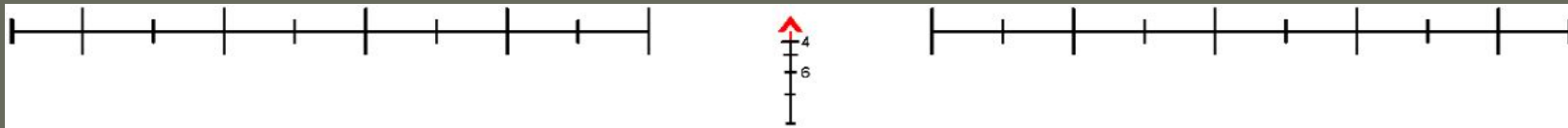
500m 600m 700m 800m



EMPLOYMENT



Target Reference System:



NOTE: The right side of the horizontal mil scale will appear out of focus. This is normal.

The AN/PVQ-31A(RCO) reticle includes a horizontal mil-scale graduated in 5 mil increments. The distance from the tip of the chevron to the first mil scale left and right is 10 mils.

The horizontal mil scale is primarily used for communicating target positions and other relationships to team members within the fire team.

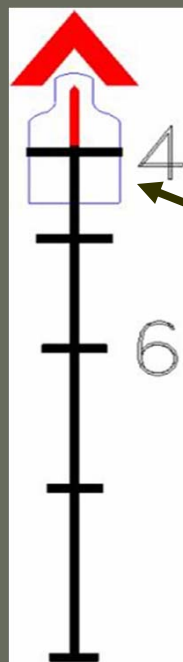


EMPLOYMENT

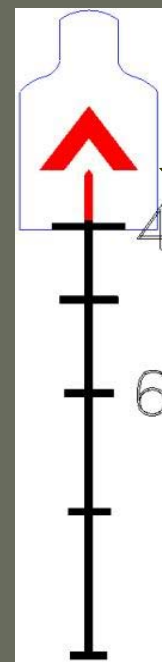


Ranging Capability: Shooting 200m-800m:

For quick target acquisition at 300m or less, place the illuminated chevron aiming point on a high center chest hold.



400m POI



100m-200m POI



FMST WP7



FMST WP7

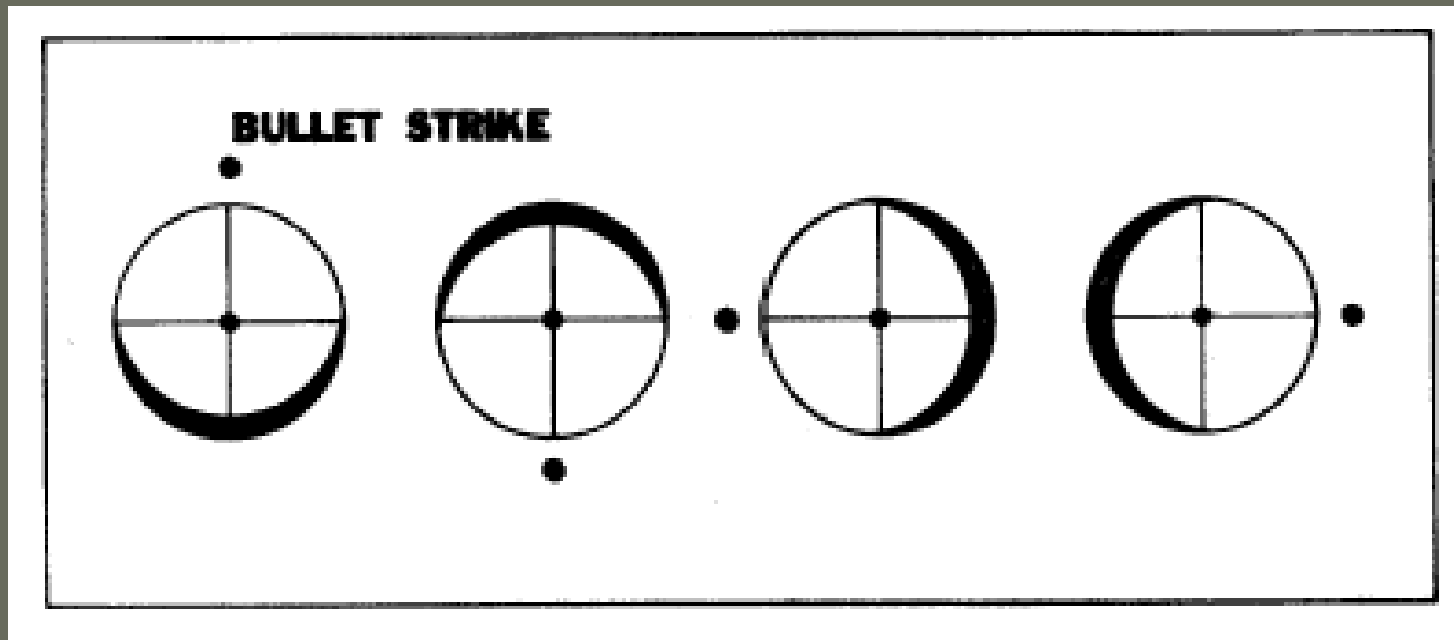


EMPLOYMENT



Shooting 100-800m: (Traditional Marksmanship skills)

Ensure you have a FULL field of view with NO shadows. Improper eye relief, or sight alignment will cause scope shadow. This will result in improper shot placement.





EMPLOYMENT



CORRECT



INCORRECT

FMST WP7





ZEROING



- Internally adjustable
- Adjuster screws used to adjust internal roof prism.
- After adjustments have been made a light tap must be made to adjusters to allow for accurate zero
- Shipped with a factory-centered zero
- DO NOT adjust the adjust the optics to the extreme

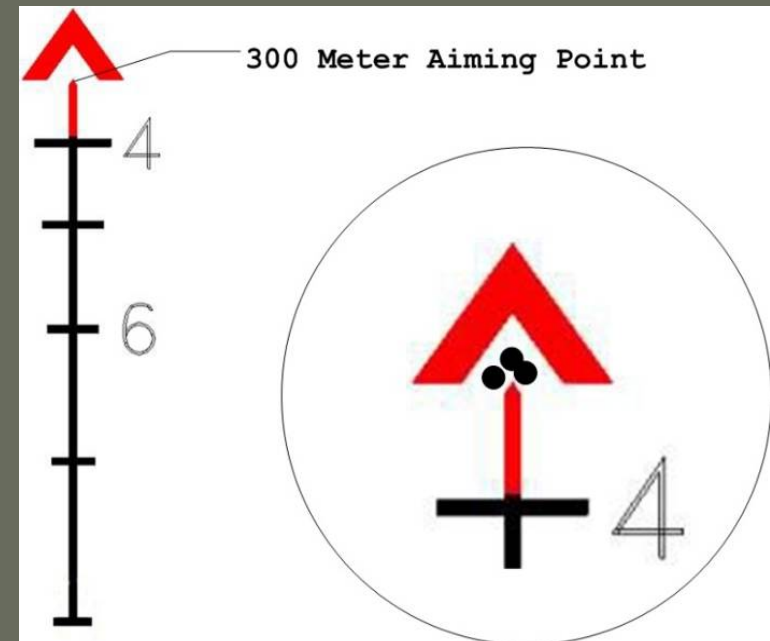


ZEROING



25 Meter Grouping Exercise

12 clicks = 1 inch



To acquire a field expedient Zero for the AN/PVQ-31A(RCO) at 25 meters, use the **tip of the 300 meter aiming point** to acquire Point of Aim/Point of Impact.

NOTE: This is a field expedient Zero only. Confirm zero at 100 meters as soon as possible

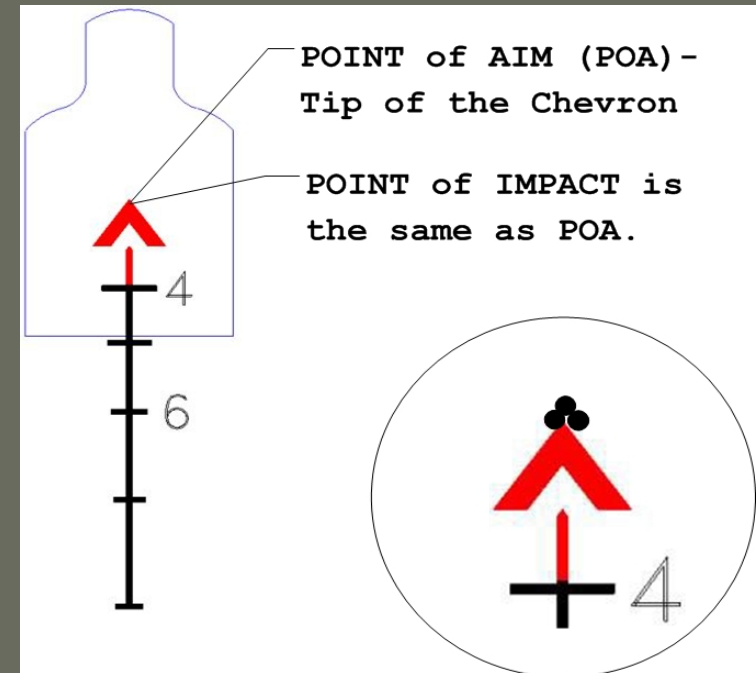


ZEROING



Zeroing at 100m -(preferred method):

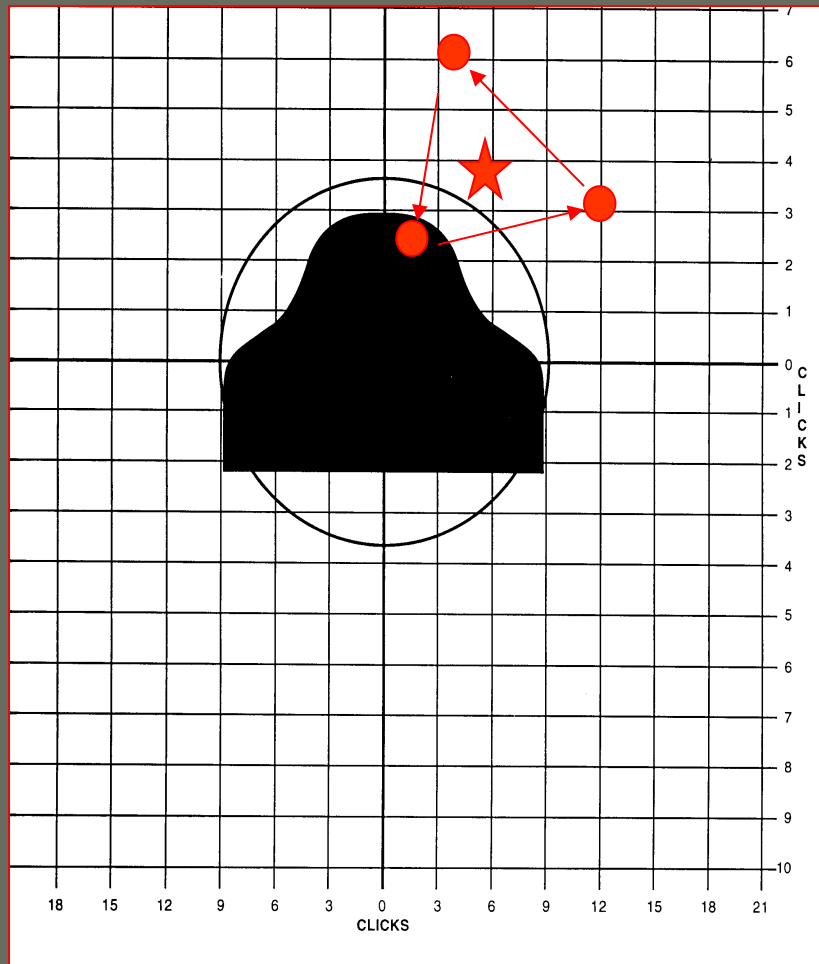
3 clicks = 1 inch



When zeroing at 100 meters, the **tip of illuminated chevron** is used to acquire the Point of Aim/Point of Impact. This method ensures maximum accuracy out to 800 meters utilizing the Bullet Drop Compensator.



TRIANGULATION



1. CONNECT THE SHOT HOLES.

2. FIND THE CENTER OF THE SHOT GROUP.

3. USE CENTER OF SHOT GROUP TO DETERMINE HOW TO MAKE ADJUSTMENTS.



TRIANGULATION



- Course of fire for triangulation fire will be as follows
 - 5 rounds (used to make adjustments)
 - 5 rounds (used to make adjustments)
 - 5 rounds (used to confirm zero)



ZEROING



Adjustment Procedures: VERTICAL / ELEVATION

Remove the **top** adjuster cap, direction of the arrow (clockwise) will move the strike of the bullet **UP** as indicated on the adjuster. **Tap the adjuster after making each adjustment.**

Adjustment increments are 1/3 inch per click at 100 meters. This means that 3 clicks are required to move the bullet impact one inch on a target at 100 meters.





ZEROING



Adjustment Procedures: HORIZONTAL / WINDAGE

Remove the **side** adjuster cap, direction of the arrow (clockwise) will move the strike of the bullet **RIGHT** as indicated on the adjuster. **Tap the adjuster after making each adjustment.**

Adjustment increments are 1/3 inch per click at 100 meters. This means that 3 clicks are required to move the bullet impact one inch on a target at 100 meters.







DEMONSTRATION





PRACTICAL APPLICATION





SUMMARY



- CHARACTERISTICS
- NOMENCLATURE
- MAINTENANCE
- MOUNTING
- EMPLOYMENT
- RCO ZEROING