



TECHNICAL REPORT

(Laser/R1)

27 Jul 92

A COMPARISON ON LASER SIGHTS AND REFLEX COLLIMATOR SIGHTS

Summary

Laser Sights

Can be used with both eyes open

Can be aimed from the hip or shoulder

Have to be zeroed to the weapon

If mounted alongside or below the barrel are only zeroed at one selected range

Are best used in low light; may fail in bright light

Can give their position away to the enemy

Require a battery

Reflex Collimator Sights

Can be used with both eyes open

Can only be aimed in line with eye

Have to be zeroed to the weapon

Can be precisely zeroed at two selected ranges and can hit a man out to the maximum likely range without adjustment

Useful in all lighting conditions

Do not give their position away to the enemy

May not require a battery

A detailed note explaining the reasons for the above follows:-

A laser sight projects a narrow beam of light towards the target usually giving a red spot which the firer can see. He puts the spot on the target where he wants to hit and pulls the trigger. Firing can be done from the shoulder or from the hip since the eye does not need to be in line with a sight. Both eyes can be kept open.

Reflex collimator sights (Ring Sights and the EPC sight) project an aiming mark optically which is focussed on the target. The firer looks through the sight (the position of the eye does not matter) and puts the aiming mark on the target where he wants to hit and pulls the trigger. Firing is ordinarily done from the shoulder since the eye must be more or less in line with the sight. Since the sights are "unit power" i.e. , have no magnification, both eyes can be kept open.

Aiming is similar with both types of sight, the difference being that with the laser sight there is a direct beam to and from the target, while with the reflex collimator sight the "beam" is projected

optically into the firer's eyes. These beams are straight while the trajectory is a parabola. Both types of sight have to be zeroed to the gun so that the bullet strikes the point of aim. If the laser or sight are above the barrel (preferably at one eighth of the gravity drop of the bullet at the longest likely range) then the laser or sight line can be reasonably matched to the trajectory crossing it at two points at which the bullet will hit the point of aim.

Ring Sights are mounted at the appropriate height above the barrel and the sight line/trajectory match has been optimised. If laser sights are mounted alongside, or worse below, the barrel, then the laser beam can only match the trajectory at one range and at all other ranges the bullet will not strike the point of aim.

With the laser sighting aiming is only possible if the laser spot (usually red) can be seen by the firer. Ordinarily, the laser used is eye safe i.e., it will not blind someone looking at it (the dimmer is the less likely it is to give the firer's position away). This limits the brightness of the spot and in ordinary daylight it can be difficult to pick up the spot and in bright light it can be impossible. So laser sights are best used in low light levels. Reflex collimator sights are usable under all conditions of light.

Laser sights are "active" and an enemy can see a sight aimed at him (the red dot in the EPC sight automatically brightens when a laser shines on the sight; and this acts as a warning device). In addition, in certain weather conditions, or in smoke, the laser beam is visible to the enemy who is then directed to the weapon position. Reflex collimator sights are "passive" and do not give the firer away.

Laser sights require a power source (usually a primary battery) and do not work if batteries are not available. Reflex collimator sights (except for the red dot EPC sight) do not need a power source and so are more useful (and cheaper to run) on extended missions.