



Ring Sight LC-40-100-NVG

The use of infra-red lasers

1. Ring Sight™ LC-40-100-NVG has a male dovetail on top of the housing to accept an infra-red laser (or other device). This dovetail is aligned in production with a specified mark on the sight graticule so that, if the laser (or other device) is aligned with the corresponding female dovetail, the laser beam is centred on the graticule mark.
2. The sight can be used to aim machine guns and cannon in the following roles:-
 - surface to surface
 - surface to air
 - air to surface (usually guns firing sideways from helicopters)
 - air to air (in helicopters).
3. The laser is expected to be used for:-
 - target illumination
 - target designation
 - target engagement.
4. Target illumination
 - a. For night shooting on dark nights the gunner's NVG cannot see targets so extra light is needed. This can be provided by a laser illuminator in top of the sight. The laser beam is diverged to light a patch on the ground. This divergence may be set in production (for example at forty mils wide) or it can be set by the gunner to suit the particular engagement. With a wide beam it is not necessary to align it precisely. Of course the wider the beam the lower the level of illumination: more distant targets will require a narrower beam: it may well be possible to choose a suitable beam width. The illumination should not be too bright as either the NVG will lower their gain or, for some types of NVG, the area illuminated will appear too bright and the gunner will not be able to pick out targets. It will be necessary to determine the NVG/laser combination by practical trials.
 - b. While the width of the lit area can be defined easily, the length of the lit area depends on the angle the beam makes with the surface. For a surface to surface gun targets standing up will be well lit while the ground may hardly be lit at all. But for helicopters in the air the patch on the ground will appear elliptical.
 - c. For shooting sideways from helicopters the horizontal lead can be more than the likely width of the beam. So it may be worthwhile to provide the gunner with a



means to align the beam with the aim-off point on the graticule chosen for the engagement.

- d. For surface to air shooting laser illuminator may spoil target acquisition and engagement with NVG. The sky usually appears quite bright in the NVG and unlit aircraft are seen silhouetted against this bright sky. If they are illuminated, they may vanish. So for shooting aircraft and helicopters it is better not to use an illuminator.
- e. The laser illuminator on the Ring Sight™ is fitted with a pressel switch so that the gunner can use it only when it is needed.
- f. Eye safety has to be considered but with a typical laser illuminator diverged to forty mil beam width it is only about three metres.

5. Target designation

This can be of two types:-

for the commander
for a homing missile.

- a. It may be necessary for the gunner to demonstrate to the commander that he has correctly identified the target to be engaged. This can be done by aiming a beam centrally or by the use of a laser spot (a laser spot, if too bright, diverged beam centrally or by the use of a laser spot (a laser spot, if too bright, conceal the target).
- b. If the target is to be engaged with a missile which homes on a laser spot (which may be coded) than a compatible target designator laser should be fitted to the sight. It can be aimed using the correct point on the sight graticule.

6. Target engagement

The laser illuminator can be used for target engagement. The beam, which has been aligned in production for the ballistics expected, is put on the target. Burst on target, using the sight graticule, can be used for adjustment of fire. This technique is only useful for surface to surface shooting in land warfare when the leads are small. It is really not worthwhile in the other roles though the width of a diverged beam can be used to aim off for lead.