



MOUNTING THE RED STAR MOUNTAIN REPRODUCTION OF THE BRITISH No 32 RIFLESCOPE

By Dennis La Varénne

The British No 32 riflescope is one of the older designs of riflescopes from an earlier era which has the moving graticle system of adjustment in the first focal plane. Modern riflescopes have an image moving system where the graticle in the second focal plane and seem to have almost unlimited ability for adjustment without distortion of the image which the graticle moving system does not.

Nevertheless, the old graticle moving system still works perfectly well, but has less range of adjustment. That requires a much greater amount of care needing to go into the mounting of the riflescope relative to the line of the bore of the rifle in both vertical and horizontal axes so that the graticle remains inside the central clear viewing area of the riflescope.

For those of us who started out shooting careers in the 1960s, most of the decent scopes of those days came from Germany and were the same graticle moving system of adjustment. Image moving scopes of those times were very doubtful on anything except a .22 long rifle.

To correctly mount the No 32 riflescope to the Lee Enfield No4 rifle requires that the riflescope be mated to the rifle in the following sequence - almost the reverse of how it is done nowadays with the image-moving riflescopes.

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1. The riflescope is clamped into the rings of the bracket;
2. The bracket and riflescope assembly screwed onto the pads;
3. The riflescope, bracket and pad assembled is then placed against the action sidewall of the rifle and fixed in temporary position so that the line of sight through the riflescope is matched to the line of the bore on the horizontal plane and also on a vertical plane above the bore line by 1.72 inches (43.68mm).
4. With the riflescope assembly correctly aligned, the holes for the screws to hold the pads in position can be marked and drilled and tapped for the screws which come with the bracket and pads.

The following procedure is one which I have learned for myself and has proven reliable. It is NOT the same as the procedure used by the British military.

COMPONENTS

So, in order to mount a British Telescope Sighting No32 Mk1, 2 or 3 or any of the intermediate conversions on the British No4 series of Lee Enfield rifles, the following procedure needs to be followed very carefully in order to keep the graticule centred as far as possible in the middle of the field of view when zeroed.

If not mounted correctly relevant to the boreline, when the scope is sighted in, the graticule can easily end up well off to one side or another or high or low of the centre of the field of view. This is both unconcerting and limiting on the amount of adjustment remaining in the mounted riflescope.

The No32 riflescope has a graticule which is a vertical picket post with a 45 degree point and a fine crosswire intended to let the shooter know whether or not the rifle is being canted before the shot. There is also a feature in the No32 rifle intended to keep this horizontal crosswire parallel to the horizontal axis of the bore.

On the originals, there was a short screw fixed into a housing under the turret assembly of the No 32 riflescope, the head of which fitted into a matching recess at 6 o'clock in the forward edge of the front ring of the bracket. This kept the riflescope at the correct vertical and horizontal relationship to the bracket so that when mounted on the rifle, the riflescope assembly was fitted exactly square to the horizontal and vertical axes of the rifle and prevented the sniper from canting his rifle (see Fig. 3 below).

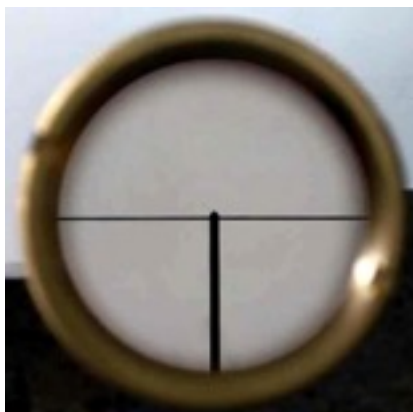


Fig. 1 - Graticule of British No32 riflescope.

To mount the No32 riflescope, there is a purpose designed mounting system comprising the 'bracket' (rings and bridgemount) which are mounted to the rifle via the 'pads' or bases in modern parlance. The components of this mounting system are shown below. The two

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distinctly different pads or bases are shown relevant to their attachment points on the bracket. The direction of fire is to the left of the picture.



Fig. 2 - Bracket and pads for mounting the No32 riflescope on the No 4 Lee Enfield rifle.

The most important consideration in mounting one of these scope correctly is to ensure that all components fit correctly together BEFORE attempting to mount the whole sight assembly on the rifle. This means that the scope is clamped in the rings of the bracket fairly firmly, and then the bracket is screwed into the pads to check of all the componentry aligns.

Maintaining this alignment is critical to correct and accurate mounting of the whole sighting system on the rifle, because once clamped into the bracket which is then attached to the pads, this whole assembled unit is then positioned against the left receiver wall of the rifle in order to mark where the sidewall is to be tapped and drilled.

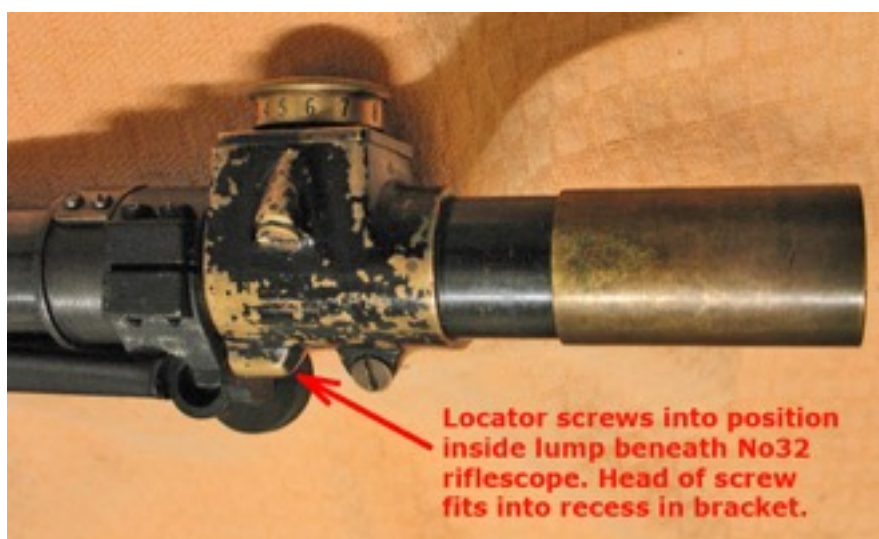


Fig 3. - Location of grub screw to align scope to horizontal axis of bore

The precise positioning of the pads allows the riflescope and bracket to be removed and refitted using the thumb-screws of the bracket and still keep perfect zero once set at the firing range.



Fig. 4. - No. 32 riflescope showing adjustment mechanism.

CENTREING THE GRATICLE

This system of mounting is almost the complete opposite to the modern convention of having rifles already drilled and tapped at the factory to take a range of bases onto which are mounted the ring bases followed by the riflescope and finally the upper clamping rings. Common to both systems however, is the fact that the graticle of the scope must be central to its range of movement BEFORE mounting.



Fig. 5 - Tool for centreing and adjusting No 32 riflescope.



Fig. 6 - Components of No 32 riflescope adjusting tool.

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There is a special tool required for this job. It is pictured in Figures 5 and 6. below and comprises two parts working together. The centre spindle fits onto the lead screw to turn it in the required direction to shift the graticle and the outer cylindrical part loosens and retightens the locking ring (See Fig. 4 above.).

Centring can be done with the scope clamped in the bracket and the bracket held in a vice. With the lead screw locking rings slightly loosened off and then tightened up barely finger tight. With the '0' on the ranging drum aligned with the index mark, the lead screw is then rotated through its full range of movement in the one direction and the rim of the drum marked. The lead screw is then rotated its full range in the opposite direction and thus marked again.

Then, the lead screw is rotated halfway back between the two marks on the lip of the drum. The lead screw locking ring is then tightened.

The same procedure is followed with the adjustment of the deflection drum, but when centred within its range of movement, the lead screw locking ring is left slightly loose so that the '0' on the deflection turret can be rotated to align with the index mark, after which the lead screw locking ring is tightened.

If the clamps of the bracket are loosened off just enough that the scope can be rotated around its own axis in the bracket (so long as there is no locator screw preventing rotation), the point of the graticle should remain on a point of alignment in the distance as it rotates. If centred correctly, the point of the graticle will not move away from a point of alignment during a complete rotation of the scope in its bracket.

IMPORTANT

*At this stage, the riflescope is ready to be mounted on the rifle. It is now that very great care is required that the bracketed scope **MUST** be mounted parallel to the longitudinal axis of the the bore and 1.72 inches above it. The bracketed scope **MUST** also be mounted centrally over the line of the bore as well.*

MOUNTING THE RIFLESCOPE UNIT

The first thing to be noted in mounting the No 32 riflescope on the No4 rifle is that the battle sight must be ground off leaving only the tangent sight because there is not enough clearance beneath the ocular bell of the No32 scope to clear the battle sight. Setting the scope in the correct position before drilling and tapping for the pads is where the fiddly part starts. The thumbscrews of the bracket need to be finger tightened.

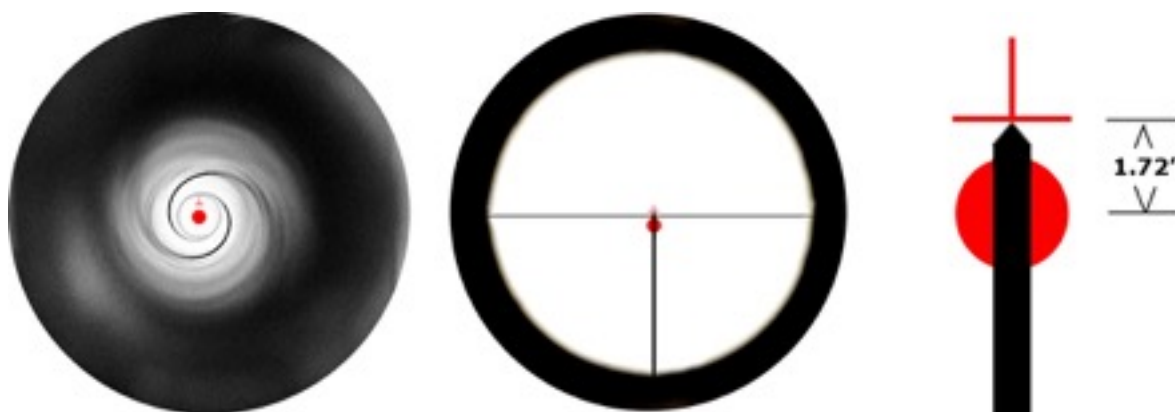


Fig. 7 - Correct alignment of bore with line of sight through riflescope.

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There must be just enough slop that when positioned against the sidewall of the No4 rifle, the pads sit where they are meant to on the sidewall of the rifle and the riflescope aligns with our alignment point which is centralised through the bore and the point of the graticle positions at exactly 1.72 inches and at 12 o'clock above that alignment point (see Fig. 7 above).

The riflescope and bracket will need to be held firmly against the sidewall of the rifle using some form of clamps or even a small dab of soft solder or 5 minute araldite. It will be found that the pads are so formed that they almost naturally lie pretty well against the sidewalls of the rifle and can be clamped there, but the alignment will not be perfect.

Usually, it will be found that the graticle may be off by a good deal. Because we know that the graticle is centred in the scope, the incorrect alignment **MUST** be because of the amount of metal in the pads and/or sidewall of the rifle. So, some polishing and light filing of mating surfaces may need to be done. This will correct only the left-right alignment though. The bracket and pads will then have to be manipulated so that the line of sight through the scope is parallel to the line of the bore. That is the reason why I have drawn up a colimation chart like that above right which can be pinned on a wall distant enough that the mark is clearly definable through the scope and big enough to be able to centre the red dot in the bore.

The inverted 'T' has its crossbar exactly 1.72 inches above the centre of the red ball, so that with the bore aligned and centred on the red ball, the point of the scope's graticle can be manipulated initially by the placement of the pads in position on the sidewall of the rifle and when as close as is reasonably possible to fix the bracketed scope and pads in position, the last little bit of misalignment can be corrected using the scope's internal adjustments.

The British military standard was to have the riflescope with centred graticle so well mounted that the point of the graticle was within 5 MoA of deflection on either side of the boreline and within 5 MoA of the line of sight exactly 1.72" above and parallel to the boreline.



Fig. 8 - The front and rear pads in position.

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Fig. 8 above shows the triple screw mounting for the front pad and the double screw mounting for the rear pad. Note also, the tapped hole drilled completely through the rear pad and the rear of the rifle sidewall. All three screws of the front pad have been 'staked' to prevent loosening under recoil - a common practice by WWII armourers.

In the following figures, 9 and 10, are two views of the front pad in situ with its upper sloped overhang fitting closely and level with the top of the rifle sidewall. Figure 9 shows the front pad from a left hand quartering on angle with its 3 fixing screws whilst fig. 10 shows the same pad from the front right hand quartering on angle and from above across the bolthead.



Fig. 9 - Front pad in situ - left hand side front showing mounting screws.



Fig. 10 - Front pad in situ - right hand side front showing mounting screws protruding through sidewall of rifle. Note the levels of the rifle sidewall and the lip of the pad.



Fig. 11 - Rear pad in situ. Note the lower moulding which seems to be designed to allow the pad to sit on a protruding ledge of the sidewall of the No. 4 rifle.

Figure 11 above shows the rear pad in situ with its two mounting screws and the threaded hole for the thumb screw of the bracket between them. Note also the lower lip on the rear pad which seems to be made so that it sits on a ledge on the lower sidewall of the rifle. It does not necessarily do so and may need to be fitted higher or lower by a few thou in order that the centreline of the riflescope runs parallel with the axis of the bore.

This picture also shows how the battle sight has been ground off the issued Singer rear sight - normal practice in the fitting of the No 32 riflescope due to the lack of clearance under the scope's ocular bell.

All of this fine fitting was necessary in order to allow the maximum amount of adjustment of the range and deflection drums without moving the point of the graticle out of the central area of focus, something not critical in today's image moving scopes.

Correcting this may need some removal of metal from either the pads or the sidewall of the rifle. Usually it will only be very minor if required. If the rifle scope points across the line of the bore, then one of the pads may need to be built up with a thin shim.

Every effort must be made to ensure that the centred riflescope is aligned correctly to a point of aim through the bore at a short distance from the rifle. I have usually done this by setting the ranging drum on 0 at 25 yards using the diagram show in Figure 7 above or something very similar. Thereafter, it is not difficult to sight the bullet strike to the point of the graticle at each of the 100 yard ranges. These scopes were so accurately calibrated that even when

sighted at 100 yards, they can be relied upon to be very close to the mark as far out as 400 yards or further. My usual practice is to then sight in to 100 yards and thereafter to make finer adjustments at 200 yards.

CHECKING THE No 32 RIFLESCOPE AFTER MOUNTING

During WWII, the British used a specialised chart mounted at exactly 28 feet from the front lens of the scope. This chart had markings which also correlated to the markings on both the ranging and deflection drums so that it could be seen that the adjustments within the scope were correct to the trajectory of the cartridge and the MoA adjustments of the deflection drum to allow for windage. This chart is reproduced below and can be copied and enlarged to 1:1.

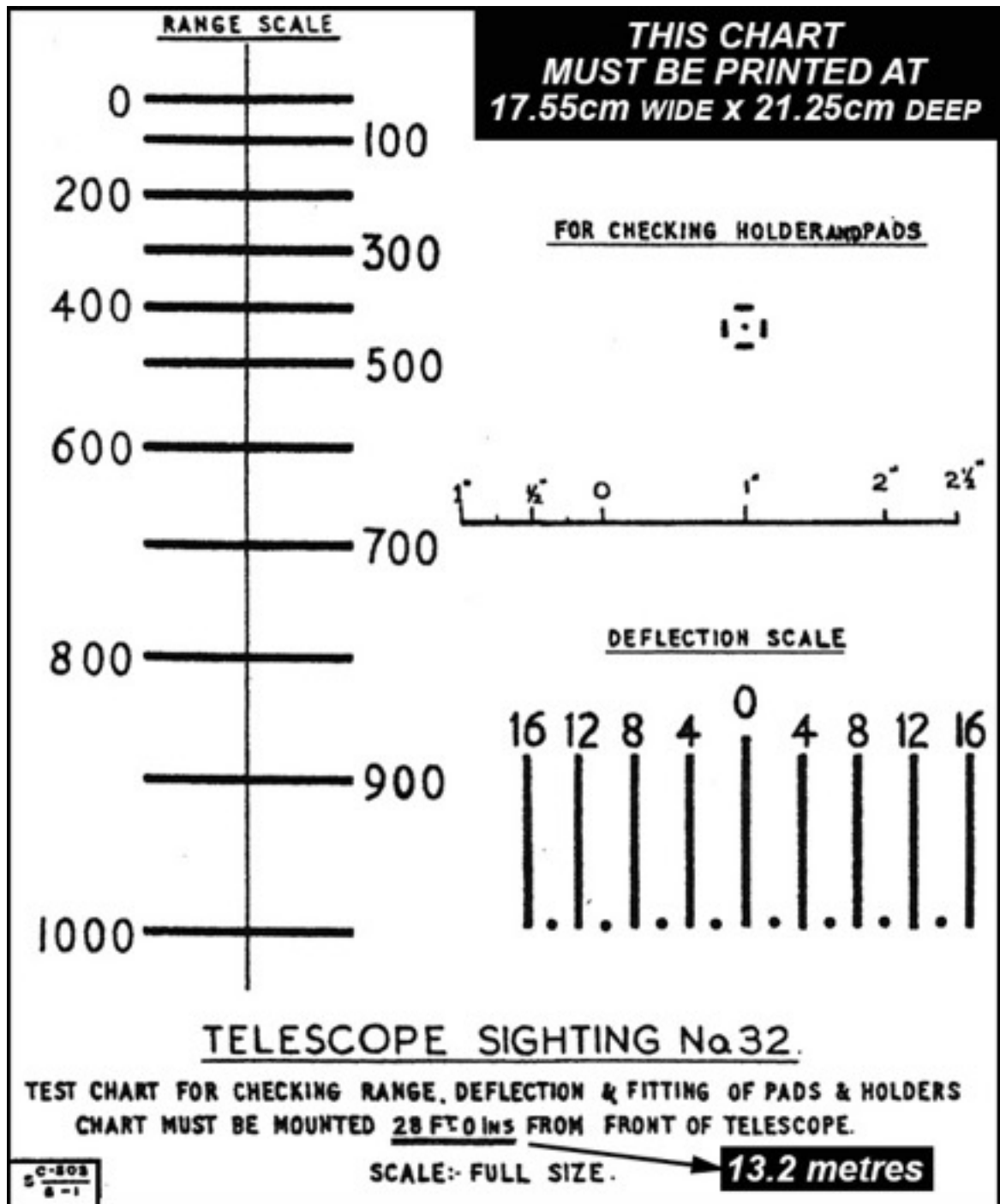


Fig. 12 - Collimation chart for No 32 rifle scope.

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With the No 32 riflescope mounted permanently on the rifle, and a full scale reproduction of this chart pinned on a wall at 28 feet distant from the front objective lens of the riflescope, and the ranging drum on '0', the point of the graticle is positioned on the '0' at the top of the 'Range Scale' on the left of the chart.

As you alter the ranging drum through the distance marks, the point of the graticle should align perfectly with the equivalent range marker on this chart proving that the clicker plate has been manufactured to correct tolerances.

The same should occur with the deflection (windage) drum. Firstly, with the deflection drum on '0', place the point of the graticle on the '0' of the deflection marks and move the drum through its range of movement, noting that as it progresses through the marks on the drum, the point of the graticle must align with the equivalent mark on the chart above to prove that the adjustments on the deflection drum are manufactured to correct tolerances.

To print this chart to correct size, one needs only to print it out from the page above, measure the inch marks above the Deflection Scale and keep enlarging the copies until the inches on the printout match real inches. The chart is then at the correct size for use.

IN CONCLUSION

Mounting the British No 32 riflescope is an involved process compared to mounting modern riflescopes on modern rifles.

However, in their day, they were superbly reliable and their usage continued into the 1970s in various theatres of war. All the mounting and accuracy work was carried out by the famed British Gunmaking firm of Holland & Holland, and once mounted, each scope was mated to its rifle 'for life', with the riflescope mounts stamped with the serial number of the rifle to which the assembly belonged. They were so well matched, that different scope mounted assemblies could not be interchanged with other from another rifle and have the same collimation and '0'.

They were rugged assemblies. I remember reading somewhere that they were sent to the front in wooden boxes with a full kit of sniper equipment for its intended user and dropped from aeroplanes on parachutes which bounced the box on the ground after landing. They were built to keep the '0' with which they were set with at the armourer's on the firing range, and they did.

For all those today who enjoy shooting in the various military rifle disciplines around the world, there is now available a well made **RSM** reproduction of this justly famous historical riflescope without having to jeopardise those originals which are so valuable and should be preserved.

These reproductions make available to the ordinary shooter, a riflescope which would otherwise be out of their price range, and the opportunity to shoot this remarkable rifle/riflescope combination once again.

One can also choose to mount a modern riflescope on the No4 rifle using the purpose designed No.4 bracket and pads with the advantages of the modern image moving system. Arguably, a better mount system for this particular rifle has never been made. Because of the less critical nature of the modern image moving riflescope, the fitting of the pads and bases will not need nearly as much finicky work in order to function well.