

Thames Valley Guns Armourers Report

Upgrading a BSA International MkII

Introduction

I inspect, service and repair .22 target rifles for a voluntary organisation that has close ties with the MOD and in early 2018 somebody made a decision that all Martini actioned rifles were unsafe and therefore had to be disposed of. From a technical standpoint this was completely inaccurate, Martini rifles if regularly serviced, are as safe as their modern counterparts and their build quality is vastly superior. I think it is fair to say that the Martini is one of those designs, that just goes on and on, will outshoot modern rifles and will outlive us mere mortals.



As a result, I was asked to dispose of the above rifle and Martini 12/15. The 12/15 I couldn't help, but the International MkII was crying out for a loving home and being the person I am, I couldn't resist, as the alternative was at best, a sale or worst, a Police guillotine.

These rifles are becoming harder to find, but they are not super rare and as a result their value is rather modest. I had a spare slot on my FAC and I had been debating about how to fill it. New rifles didn't really rock my boat, nor did the BSA in its current guise. However I asked myself the question, what if I upgraded the rifle to a more general sporting format. I sure the purists would be spitting on my grave or worst, but it would give the rifle a new lease of life, make it multi-purpose, more attractive, but more importantly, I'd be happy to have it on my ticket.

Before embarking on this project, I needed to know if the rifle was suitable for purpose and therefore I stripped it down, checked the action and the bore. Whilst the woodwork had taken some knocks and was scratched, the action and bore were perfect.

If I was going to make it multi-purpose, what shooting disciplines did I have in mind? Well it should still retain the capabilities of a prone target rifle, I fancied some long range .22, some indoor gallery standing shoots and finally some field use. For all of the above except prone target, the rifle required a modern scope mount and scope, standing and field required some weight loss. Field and long range required a bipod and finally, prone target required the ability to fit the old aperture sights.

Therefore the plan was as follows:

1. Shorten the barrel to 18" and flute.
2. Thread the muzzle for a moderator and thread protector.
3. Shorten the forend and fit accessories rail.
4. Retain aperture sight mounting blocks
5. Side mounting weaver scope rail

BSA International MkII

In the next few short paragraphs I will provide some details of the MkII in its original specification but should the reader want more detail, I suggest looking at the following site as it supplies an excellent level of technical information: http://rifleman.org.uk/BSA_Martini_International_Mks.I_&_II.html

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The BSA MkII came originally in two types, a heavy & light barrel version. The rifles overall length is roughly 44.0", with a barrel length of 28.0", weight was a hefty 14.0lb and rifling was six groove with a 1 in 16" twist.

Unlike the small frame Martini's such as the BSA 12/15 the MkII had a much more substantial and larger frame. The trigger/breech block housing is much longer and supports a sophisticated and adjustable trigger mechanism with a spring loaded ejector.

The forend, although much bigger, secures to the barrel in the same way as the small frame BSA's with a single large screw, screwing directly into the barrel. The butt is also fairly substantial, made from nice walnut and it secures to the receiver in a similar way as a Lee Enfield No4. The pistol grip has a palm swell and on the cheek pad there is a small groove which permits the cleaning rod to enter the rear of the receiver for cleaning purposes.



The rear aperture sight was a Parker Hale PH25B and was secured using a receiver side rail. A traditional block was used for the foresight assembly and a further two blocks were fitted along the barrel, should the user wish to fit a scope.



In summary this is a classic target rifle that is now seventy years old, however many will say, these rifles represents the epitome of .22 heavy target rifles and even with today's modern designs, will easily stand their ground in terms of accuracy.

Upgrade - Barrel & Receiver

Whilst I haven't altered the receiver in anyway, to make this rifle more multi-purpose I had to lower the rifles weight and therefore I decided to reduced the barrels length to 18.0". Depending on the .22 cartridge used, the typical standard .22 propellant is burn out after 12" and therefore 18" was a balance between weight and maximising the cartridges performance. To reduce the weight still further, but not impact on performance in any way, I also fluted the barrel as can be seen in the bottom left image.



As the rifle was going to be used for field work, a moderator was required and therefore the muzzle was threaded for a moderator and fitted with a flush fitting thread protector.

The barrel had been drilled and tapped for scope blocks in its original format and therefore I decided to retain not only the holes but also the blocks to permit an element of flexibility, should I want to add any other attachments.

As I planned to fit a scope, I had ordered a scope mount which had a cerakote protective finish and therefore I decided to have the barrel and receiver cerakoted to match. Although a break from the traditional blue, cerakote would provide a superior protective finish in the field.

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Upgrade - Butt

My plans to upgrade the butt was minimal with my main focus to remove all the old varnish finish and restore the butt to its former glory. However I had considered a modern recoil pad but believe it or not, there wasn't one available, that was big enough and therefore I was lumbered with the original BSA pad. Not a problem but it had seen better days.



Another fitting was the Parker Hale element holder which secured to the bottom of the pistol grip, but as part of the restoration I decided to omit the holder as a scope would be used for the majority of time, therefore making the holder somewhat redundant.



Upgrade - Forend

The forend had seen the most of the previous owner damage, an amateur attempt at fitting an accessory rail, sling swivel and full length barrel bedding had caused a fair amount of damage and now had to be repaired. With the 28.0" barrel being reduced to 18.0" there was an opportunity to reduce the forend's length and in turn remove some extra weight. The old bedding material was removed, the sling swivel hole plugged and the accessory rail cleaned up and correctly fitted.



Once repaired, the forend had to be cut to length, providing the correct handling, the correct size in relationship to the new barrel length and the correct profile.



The old accessory rail had to be stripped, cleaned up and refitted, filling in any gaps that were left from the amateur fitting.

Scope Mount & Bullet Holder

The scope mount and bullet holder was purchased from a Australian manufacturer, retailing on eBay. Delivery was really good, taking only a week, but this was reflected in the added shipping costs. There is an alternative mount available from the "shooting shed" here in the UK but by the time I had identified this source, I had already purchased the "Aussie" model.

I had ordered a weaver style base and upon arrival it was clear the aluminium build and cerakote quality was of good quality. There was no burrs, sharp edges or tooling marks, which impressed me. On the side of the mount was engraved the words "BSA International", which I thought was a nice touch. The mount secures to the receiver using the same screws as the original rail, but new mounting screws are supplied as the original aperture sight screws are of a narrow tapered design and therefore unsuitable for the new mount. Once fitted the mount is very sturdy and with a 130mm rail, will support most scopes.



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Although not 100% sure about its purchase, I went ahead and brought a replica bullet holder. Designed for the target shooter, it would certainly come in handy for any gallery or long range shooting but would be unsuitable for any field use. Build and finish was very good, but it is manufactured from a casting and therefore there is some minor porosity, which to honest was not a problem.

Optics & Rings

I purchased a Nikko Stirling 4-16x50 Diamond LR (long range) scope for this rifle. Price wise this is not an expensive scope at a shade under £250.00 and therefore it can be classed as a budget model. The decision to purchase this scope was



based on cost, performance and type of rifle it was to be mounted on, with cost being my primary decision making factor. This rifle is only worth around £250, but I was adding a further £700 for the barrel work, re-proofing, cerakoting, mount and the rings, let alone labour time, so you can understand why I didn't want to spend a small fortune on a scope.

I have had some experience of the Nikko range and as long as you realise they are a budget scope, then value for money, they are pretty good. From a performance standpoint x16 magnification was fine for a .22 rifle shooting out to 100-120yds, tactical drums are essential, so you can dial in the exact distances and not aim off. Nikko call their reticule, "Holdfast" and it is etched into the glass and uses a series of small lines that match known ammunition types and their ballistic drop. Lens quality is good, but this is where, one must remember, "what you pay for is what you get" but for ranges out to 120yds it is more than adequate.

At the rear of the ocular lens is a fast-focus eyepiece, forward of this is the magnification ring with raised segments which provides a reasonable good grip and altering the magnification is fairly smooth. Elevation and windage turrets pull up to unlock and push down to relock. The large elevation drum has a zero stop feature with 1 click equals $\frac{1}{4}$ MOA, However whilst one complete revolution on the drum produces 20MOA, my scope only managed 16 MOA before it hit the stop, which is 63 clicks and not the advertised eighty. However that may be because I have not zeroed and set the scope yet. Operation of the drums is very good. On the left of the saddle, is the combined parallax and rheostat drum which provides red and green illumination to the holdfast reticule. As I have no plans to use the rheostat, I removed the battery to prevent any long term damage.

It is at this point, I feel I must add a small observation. I personally found the parallax drum difficult to grip and therefore somewhat stiff to rotate. If Nikko used the knurling found on the focus ring, it would be much more suitable. The scope has a 30mm tube and a 50mm object lens, personally I would have preferred 44mm, but beggars can't be choosers. One final note about influencing my decision about this scope purchase was the big but low profile drums. The BSA is a big twenty two and its large action, couple with a large butt and scope, makes for 10" between the heel and the top of the scope.

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Final Build

The original rifle weighed 14.0lbs and with the various modifications that has been reduced to 11.9lb, together with the scope. The barrel is now 18" and the overall length is 33.0" without the moderator and personally, I think this rifle is far more practical for modern use and in the various disciplines that I intend to use it for.

I didn't test the rifle before I went into this project which maybe with hindsight was a little rash but with all my



customer work, I have less and less time to work with my own rifles. To make the project more interesting, maybe I should have tested the rifles accuracy at 30, 50 75 & 100 yards and done the same after the modifications where completed. Likewise also measured muzzle velocities with the 28" barrel and then the 18" to reflect the difference. However, experience has taught me that long .22 barrels actually reduce velocity slightly with standard velocity rounds. As the propellant burns out, available energy is reduced, yet the bullet still has to overcome the resistance of those last few inches of barrel.

The modified forend was now only 9.5" long, had a much more rounded forend, with a more long and low angle leading edge up to the barrel, which gave a much more dynamic profile. The accessory rail was now a mere 2.0" long, but sufficient for a QD block and stud which allowed the fitting of a small Harris 6-9" bipod. The butt had the old decorative white spacers and the element holder removed, so the butt and butt plate matched the matt finish of the cerakote.

The scope bracket and rail was superb and once secured to the receiver, was locked solidly in place. The Rechnagel low 30mm rings complimented the bracket well and permitted the scope to fit at the correct height and with the correct eye relief.

Accuracy Test

The accuracy test was done at 40, 60 , 80 and 100 yards, shooting from a bench and fully supported. The rifle was fitted with a moderator and Eley Sub Sonic ammunition was used for the test. Initial zeroing was done at 40 yards, thereby allowing the drum to be set to zero prior to recording the various range graduations.

To be honest this grouping session was simply to zero the rifle and to see what the rifle was capable of achieving. The first 3rd group shot at 40yds achieved this 8.0mm group, which was exactly what I had anticipated with repeated attempts, produced similar groups,



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varying between 7.0 and 9.0mm. My next two three round groups were both shot at 60 yards, one group by my daughter and the other by myself, with both groups producing 11mm patterns. At 80 yards, I was struggling to see the bullet strike and therefore change my target type which in turn generated this 20mm group as shown in the middle image. The right hand image was shot at 100 yards and even with the “shoot & C” targets I was struggling to see the strikes. The first round went high and can be seen at the 12 o'clock position, which in turn required slight adjustment to the scope. The next five rounds went around the bull with the final shot hitting the bull itself and producing a 37mm group. As mentioned earlier, this exercise was to zero the rifle, produce range cards and ascertain the rifles grouping capability at the various ranges, it was not to compare with other rifles types as the BSA is well known for its exemplary performance.

Summary

Because I put my heart & soul into these rifles, I am always going to be biased with any build I do, however one must remember this build was completely unplanned, but the outcome was very pleasing and fairly unique. Recent years had seen me drift away from “twenty two’s”, selling most of my collection with only two 1930 Mauser’s remaining, but this typically British rifle will make a nice addition to the collection and has rekindled my enthusiasm somewhat.



In Sept 2019, I am losing the farm, where I shoot, as the farmer is selling up and therefore I will be unable to pursue any further field shooting. As we speak, the only alternative will be my shooting club or the NRA at Bisley, where I fancy having a go at the mini McQueen’s. Either way, shooting this rifle in its traditional format held little interest for me but in this rebuilt format, I found this rifle so much more interesting and as a result am looking for competitions to enter it in.

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