

# Thames Valley Guns

## Armourers Report

### Restoring a BSA CFT

#### Introduction

Having restored the BSA Hunter, I was keen to tackle another BSA and the next one to become available was a .308 CF2 or more accurately the CFT model, "T" standing for target.

I drove down to Reigate in Surrey, UK to have a look. The rifle wasn't in bad condition, the receiver and bolt were good, barrel was approximately 45% worn and the woodwork had taken the customary knocks, from over the years.



Whilst the rifle was not in peak form, I was interested in restoring the rifle back to its prime and therefore decided to go ahead with the purchase.

In 2017 I got bitten by the "accuracy bug" and although not a true target shooter I was keen to maximise the rifle's accuracy and compete against more modern target rifles. I had a period scope in the form of a Lyman x25 LRBR and a selection of some

Parker Hale 1" rings to choose from. Having identified the rings with the correct height, I fitted the scope and scrubbed the barrel to remove any excess deposits. Worn barrels are not just worn, they often have excessive copper and carbon deposits which badly affect accuracy. Having cleaned the barrel I headed off to the range with some old Radway Green ammunition. I saw no point in wasting quality ammunition at this stage, simply basic ammo for a basic rifle. Shooting at 100yds from a bench, using a bag, the first step was to roughly zero the rifle. Again there is no need for pin point accuracy, it's just wasting ammunition because at this point all you want to know is how the rifle performs so you can make a decision. The next step was to see what groups the rifle was capable of. The first few rounds highlighted that barrel performance was modest at 1.0 to 1½" and therefore I decided to discontinue the shoot.

Back at the workshop, I cleaned the barrel and ran a borescope down the bore to have a closer look. The previous owner had kept the bore clean, but it was tired, with craze cracking and worn lands, therefore I decided to re-barrel. Like many restorations, the decision to restore and re-barrel is not a cost effective solution. You will not be able to sell the rifle for what you invest in its restoration. The rifle is only worth £350 in its current condition, to re-barrel, restore and bed will cost triple what the rifle is worth. Therefore the decision to fully restore is purely based on the passion to see the rifle in its former glory, not its after sale value.

#### History

With the first BSA short action Hunter appearing in 1954, BSA continued to produce a series of quality sporting rifles, which incorporated design improvements, brought on by market research, advancement in manufacturing techniques and improvements in production. These advancements were reflected in the Majestic, Monarch and finally the CF2 models. The CF2 was the last of BSA's successful centrefire rifles and was introduced in late 1972, with production running to 1986.

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Unlike previous models such as the Majestic and Monarch, the CF2 was not a product update but a completely new design. The rifle was exceedingly well made, the new bolt design was forged from a single ingot and incorporated a full length precision rib which supported the bolt throughout its full cycle. The receiver was also machined from a solid forging with the bottom of the receiver being flat to permit better bedding and less flexing caused by the stresses of firing.

Initially launched in .270 Win and 30.06, other popular calibres soon followed such as .308, .243, 7x57, .222 and magnum calibres such 7mm and .300WM. However all these rifles were in a sporting or hunting configuration and at the beginning of the 1980's, BSA introduced a single shot target model in 7.62 NATO, which they designated CFT. Mechanically the rifle differed from the sporting rifles by having a heavy target barrel, no magazine well and a large target stock. So successful was this design, that BSA designed a Sniper prototype, but I have been unable to find a picture of it and I believe BSA discontinued its centrefire rifle range, before it could be brought into production.

#### CFT Receiver

The receiver is machined from a solid steel ingot and is 8½" long and 1¼" wide. The barrel screws into the receiver in the traditional way. Running internally down either side of the receiver, are the guides for the bolts twin locking lugs, which when fully engaged, rotate and locked in corresponding lugs in the receiver. However what is unique on this rifle



is a guide rib that seats behind the left hand locking lug and runs the full length of the bolt to the rear of the bolt handle. The purpose of this guide rib is to produce stability and avoid "bolt wobble" as typically found on Mauser actions.



The safety locking lug is the bolt handle recess at the rear of the receiver. The loading/ejection port is a shade over 3¼" and is designed solely for the 7.62mm NATO cartridge. The upper receiver has a 17mm scope rail, but unlike earlier BSA models has a number of recoil lugs to correspond with the Parker Hale rings of the day. Rail dimensions were reflective of the period and where designed for the British Parker Hale rings, fine for commonwealth countries, but less prolific in the America's which probably cost BSA considerably in lost sales.



The lower receiver is secured to the stock via the traditional master screws and a single recoil lug. The bottom of the receiver is flat for an accurate and strong receiver to stock bond. The lack of a magazine well adds to the rigidity of the receiver design and therefore increases accuracy. To the rear of the receiver is the trigger assembly well, where the one piece trigger unit is secured using two pins.

On the left of the receiver is the gas vent, the word CFT, serial number 151 and the corresponding proof marks. Overall machine finish is to a high quality with a deep traditional bluing.

In summary the receiver is an excellent, strong design with a high quality finish, minimal parts and a smooth cycling action. As I had fitted a new stainless steel barrel and to improve the rifles overall appearance, I had both the barrel and receiver cerakoted as can be seen in the images above.

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#### Trigger Assembly

The early BSA trigger assemblies were quite unique for their time in that it was a one piece unit that contained the trigger, trigger pawl, sear, sear trip, various springs and ejector. With the introduction of the CF2 models the trigger unit had been improved slightly. The side plates now consisted of two steel plates with the axis pins supporting the working parts and the safety catch. The sears secondary role is to act as the bolt stop but unlike earlier models, the whole unit was secured in the trigger well with two roll pins.

On the CF2, the safety catch is part of the trigger assembly and the safety can only be applied when the firing pin is cocked. When the bolt is cocked and closed, applying the safety catch also locks the bolt in the closed position. However applying the safety catch, when the bolt is open, allows the bolt to be cycled and thus clearing of the chamber.

#### Removing the bolt

Removing the bolt differs from model to model. In the case of the BSA CF2/CFT. Simply open the bolt and depress the trigger. Keeping the trigger dressed will allow you to remove the bolt.

#### Bolt

As mentioned earlier, the CF2/CFT models were an all new design, which was also reflected in the bolt assembly. Whilst the bolt uses the traditional twin locking lugs, unlike the Hunter series, the claw extractor has disappeared and has been replaced by a spring loaded extractor located in the bolt face, something which was carried forward from the Monarch models.

The recessed bolt face also houses the ejector and when the bolt is fully closed, it is completely encased in the rear of the barrel, making for an extremely strong and safe design. Like previous designs, the cranked bolt handle and bolt body are part of the same forging, which adds considerable strength to the design. The purpose being, that the bolt handle acts as the third safety lug, when engaged in the receiver. However I have seen shooters grind down the bolt handle to increase the clearance for the scope, not realising this is a dangerous practice when the bolt handle acts as the safety lug.

As previously mentioned in the receiver section, a unique feature to the CFT and CF2 was the introduction of the bolt rib, which runs along the entire length of the bolt. The purpose of this rib is to act as a guide and prevents bolt wobble which was common in Mauser type designs.

Compared to older models, the steel cocking piece has a new profile, and contains the firing pin and the gun state indicator. The gun state indicator is a brass plunger which protrudes from the top of the cocking piece. When the action is cocked, it protrudes and when the firing pin is released it lays flush with the surface, thereby giving a clear state as to the rifle condition.

As previous models, the bolt cocks on opening and therefore lifting and rotating the bolt body, cams the firing pin to the rear and engages in the bent on the bolt body. At the same time the cam on the top of the bolt handle engages in a corresponding cam in the receiver, which in turn generates primary extraction.



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The bolt has now reached its maximum rotation, the main locking lugs have disengaged and it is now possible to pull the bolt to the rear. Rearward movement of the bolt is arrested by the sear as it engage in the bent on the bottom of the bolt body. The position of the bent or recess in the bottom of the bolt body varies depending on the rifles calibre. In the case of the 7.62 NATO cartridge, the bolt is withdrawn past the rim of the cartridge, the sear rises and engages in the bent and rearward movement of the bolt is arrested.

Having overcome primary extraction and the firing pin has been withdrawn, the empty case is extracted from the chamber and is held on the bolt face by the extractor. The bolt face ejector is kept depressed until the empty case clears the ejection port. At this point, it is allowed to raise under the influence of its spring, push the rim of the cartridge, pivot it around the extractor and eject the empty case away from the rifle.

Unlike the CF2, the CFT is single shot and has a solid steel loading tray which is integral with the receiver and aligned with the bore, therefore there is no feed ramp. The shooter places a round on the tray and pushes the bolt forward. The cartridge is fed into the chamber until forward movement is halted by the chamber shoulder. The bolt continues forward slightly as the ejector is depressed and the rim of the extractor overrides the cartridge rim. Forward momentum is halted and the bolt handle is rotated, the firing pin bent engages on the sear and the locking lugs, lock into the corresponding lugs in the receiver. Whilst the trigger can be depressed at this stage and the firing pin released, the firing pin cannot strike the cartridge until the bolt handle is fully depressed, thus ensuring mechanical safety.

In summary this is a nice bolt, cycling is smooth, ejection is highly effective, the safety catch engagement is positive and easy to apply and the gun state indicator is highly visual and easy to detect in the dark. However an Armourers note, when new, spring loaded plunger type extractors are extremely effective at ejecting a empty case away from the rifle, regardless of what speed the bolt is withdrawn, however as these springs wear and are effected by age, effectiveness drops of rapidly and the empty case is dropped within the receiver, until the spring is replaced. Fixed ejectors remain effective throughout the life cycle of the rifle.

#### Barrel

The original tapered barrel is 27" long and is 1.8" at its widest point and narrows 0.8" at the muzzle. Although the original barrel shot well, it had seen years of use and a good way to describe its condition is that "it was on the wrong side of 50" and therefore I decided to have it re-barrelled. I mentioned previous this is not a cost effective solution as a new barrel costs more than the rifle is worth. Therefore this decision is based solely on the decision to restore a classic rifle. The new barrel was to have the same dimensions as possible to the original and to be fitted with the same foresight assembly.

Around the chamber of the original barrel was the various proof marks, which with the new barrel have been replace by the current proof marks and their dates.



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## Stock

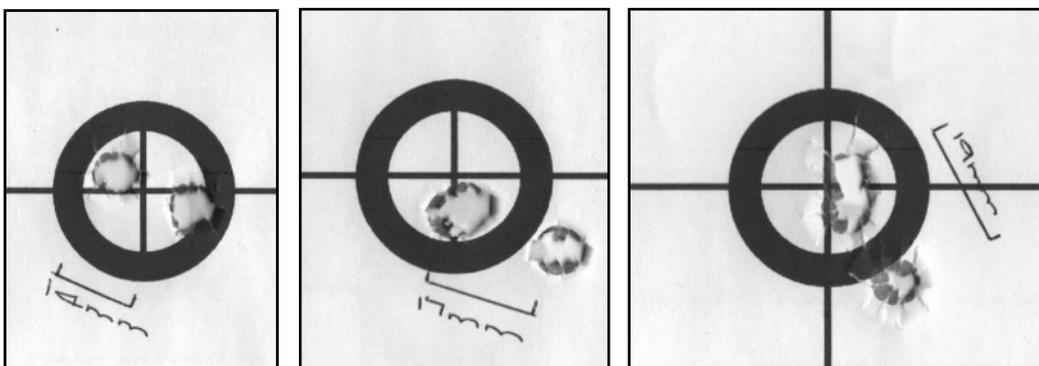
The CFT stock differs considerably from its CF2 counterpart. It is much bigger, heavier and designed from the outset as a target stock. As there is no magazine, there is no magazine well. The stock is fitted with an accessory rail, which in its day would accommodate a sling and hand stop. The pistol grip is more pronounced and the butt has an enlarged cheek pad and an adjustable recoil pad.



The original stock was in beech and had been finished with a dark lacquer. As with many classic rifles this dark lacquer finish had many transit marks reflective of its age and therefore I decided to remove it and return the stock to its natural beech finish. As with most rifles of the period, the original stock was not bedded and was seated directly into the wood, therefore to maximise the rifles performance I pillar bedded the action as can be seen in the image above. BSA was an innovative rifle company, therefore you must ask, why did manufacturers not bed their rifles to get the best performance from them, I appreciate modern epoxy resins where not available, but why use not use an aluminium block or pillars to improve accuracy. I don't know the answer, but I guess it was probably a combination of things such as cost, wrong time-wrong place, shooting altitudes and concepts.

## Accuracy test

As mentioned at the beginning of this report, my initial ranges test at 100 yards, had produced 1-1.5" groups using Radway Green, (EX MOD) ammunition. As the rifle was fitted with a new barrel, some "running in" was required, plus I decided to carry out some load preparation. I chose N140 and RS52 as the two powders of choice. Using Lapua brass and Sierra 155gr bullets I produced 50 rounds with each powder and headed off to the range with my chronograph and cleaning rod.



Best results were 44.5gr of N140 and 45.5gr of RS52 and whilst there was little in it, N140 had the edge and therefore back at the reloading bench, I produced a further 50 rounds using N140. The next trip to the range, shooting fully supported and at 100 yards produced the following three round groups.

In Harold Vaughn's book "Rifle accuracy facts" an average of 8-10 five round groups produces the most accurate data, however I do not have the time, therefore my approach is hardly the most scientific, however the average for these three, three round groups was 16.6mm. The fact that this rifle and my shooting ability can produce these groups was perfectly acceptable for me.

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A few weeks later I was able to shoot at 600 yards with some friends, all shooting very modern .308's with the latest target actions and aluminium stocks. I was the only person shooting a classic rifle and without any direct comparisons the BSA CFT not only shot well, but sometimes better than my fellow shooters.



## Summary

Returning a tired rifle from the precipice is always a pleasure. Together with the correct Parker Hale rings, I fitted a Lyman x25 LWBR scope which was produced from 1975 - 1985 and therefore made a fantastic period scope. Trips to the range had revealed no issues and the rifle functioned flawlessly, with excellent accuracy.



To be honest its hard to find criticism, the rifles profile is sleek without the rough edges of the competitors, whose heritage was from a previous generation.

Similar target rifles of the period, was the Parker Hale TX1200 (mauser action), T4's (Lee Enfield action) Winchester M70 and the Australian Sportco M44. Based on my experience, I have shot them all and in my humble opinion only the Aussie M44 comes close. The rifles sleek

profile, trigger unit, built in scope rail, pistol grip stock and the bolt rib, makes the BSA CFT ahead of its time when compared to other models of the period.

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