

# SIG MCX

## DREAM BUILD

FOR THIS ISSUE WE'RE JOINED BY OUR GOOD FRIEND JOHN T WHO TAKES A LOOK AT THE "TOOL OF CHOICE" FOR SPECIALIST LAW ENFORCEMENT UNITS IN THE UNITED KINGDOM, AND WORKS WITH DAN FROM TACTICAL PARTS IN THE USA TO CREATE HIS "PERFECT" SIG MCX!



In the years leading up to the 2012 Olympics, the Metropolitan Police Service (MPS) in the UK (aka "the Met"), the highest authorised Police Firearms Officer was the Specialist Firearms Officer or "SFO". With the potential threat level for terrorist actions and as part of the preparation for the Olympics, the Met trained some of their officers to a much higher standard, mostly along the lines of the UK Special Forces (SAS and SBS). This would include fast rope access from helicopters, maritime operations, explosive methods of entry (EMOE), more specialist equipment in order to deal with potential threats and also using live rounds during Close Quarters Combat (CQC) training.

Thames Valley, Greater Manchester, West Midlands, West Yorkshire and Strathclyde Police (now Police Scotland)

also increased their training and capabilities by equipping their officers with the same equipment and procedures as the Met CTSFOs.

Together the force areas would form the national Combined Response Firearms Teams (CRFT) and they would provide armed police officers known as Counter Terrorist Specialist Firearms Officers (CTSFO).

In August 2016, the Metropolitan Police Commissioner, Sir Bernard Hogan-Howe announced that the first of 600 extra armed officers were ready to be deployed to work in London. With the photos of the public "unveiling" of the CTSFO published, those airsofters who were interested in making an "impression" of the new CTSFO were on the lookout for the must-have rifle that was issued to the CTSFOs and this was the SIG SAUER MCX rifle, along with the Arc'teryx TALOS clothing and Grey C2R plate carrier.

### LICENSED MCX

When Cybergun released their licensed SIG MCX, these players were straight to the shops to get one and soon the impressions were being seen at airsoft sites around the country. With the gradual release of photos of the CTSFOs on operations, various "builds" were being seen and some parts becoming the next "must have" part for the players.

The Cybergun MCX, OEM by VFC, came equipped with the fantastic VFC Avalon gearbox and sported the same KeyMod rail as the real MCX. Out of the box the MCX gave approx. 300fps but in a quite rare occurrence for airsoft manufacturers, VFC also supplied three extra main springs (M100, M110 and M120) which could be speedily changed via the quick change (QC) spring guide. The only drawback was the lack of space provided for the battery. This could be easily addressed by either the addition of a battery box PEQ or the use of the "Suppressor Compliant" rail which SIG produce for the Real Steel Firearms.

This, however, is quite an expensive option, costing nearly half as much again

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as the cost of the base rifle. When real CTSFO were seen with suppressed rifles this rail also became a must-have and then the search was on for a suppressor with the right “look” for the impression. A small number of similar looking dummy suppressors were CNC manufactured by JTac Custom Ltd. The “cans” had the ability to accept the Xcortech XT301 tracer unit as well as some foam discs, so that users had the option to use tracer BBs in game.

Fast-forward to 2019 and with the discontinuation of the Cybergun MCX, SIG SAUER® announced that they would be taking the control of the Virtus MCX in-house, under the ProForce banner and customers were then eagerly awaiting the release of the new AEG rifle. When SIG decided to stop making the older model of MCX (now known as the “Legacy” MCX) the new model would be called the “Virtus MCX”. (For an in-depth review of the Cybergun MCX, check out Scott’s report in the April 2018 issue of Airsoft Action.)

## THE SAME, BUT DIFFERENT

There are a few differences between the Cybergun “Legacy” MCX and the ProForce Virtus MCX AEGs:

- Gas Block: this has the new Virtus looking gas plug.
- The outer barrel is longer than on the Cybergun Legacy MCX by 75mm (3”) difference. The Legacy was fitted with a 195mm outer barrel (and also a removeable 10mm extension), whereas the Virtus comes in at 280mm. It also has a flat portion on the top of the barrel, which nicely addresses the problems with the Cybergun rifles where it was a nightmare to get a battery to fit. The battery storage on the ProForce is also helped by cutting down the mock gas piston would be and was on the Legacy rifle. For those who really prefer the battery and wiring not to be seen, wrap them in fabric tape and they almost disappear inside the rail. A good feature with the outer barrels on the AEGs is that they are interchangeable between the Legacy and Virtus models. There is also an option for a 6.75” barrel which is available through Virtus Training Systems Ltd.
- A huge difference in the rails is obvious, as the Legacy was Keymod and the Virtus is MLoK. Another big difference is the overall length of the rail. Legacy comes in at 203mm and 41.5mm wide, where the Virtus rail measures at 262mm long and 43.5mm wide. The Picatinny rail on the top of the receiver is also changed to mirror the differences in the real rifles. The Legacy has a rounded profile whereas the Virtus is

the standard flat in the same way you’d see on something like an M4.

Small differences between the two versions are that the Virtus has the addition of “Exeter-NH-USA” under SIG SAUER INC on the receiver, while the ejector cover is slightly set back on the Virtus model and also has nice “Virtus” and Logo engraved on it. Looking underneath the rifle around the trigger guard, we can see the Pentagon with “F”, which means it will be accepted in Germany, provided it is converted to semi-auto only. There is also a warning on the base of the trigger guard to “Wear eye protection – this is not a toy – Read Owner’s Manual” etc.

Other than those differences that have been noted, it is essentially a common lower, gearbox, controls etc between the two models.

Usually I am one who may change a hop rubber and stop there, but for this Virtus MCX I decided I would “upgrade” a rifle and then make some side by side comparisons on the range.

Dan, from Tactical Parts in the USA and the tech behind the excellent Black Swan Dynamics custom builds, has completed a similar upgrade build for my KWA T6. Here he lays out the upgrade work on my ProForce MCX.

## The MCX “Wolf Mod”

This upgrade is based on previous work with upgrading a KWA T6 for my colleague at UK’s JTAC Custom, something now colloquially referred to as the “Wolf Mod.”

Distilled down to the nuts and bolts, the “Wolf Mod” is a full makeover of the internals with a Gate TITAN, new gear ratio, upgraded motor





and compression parts, as well as outfitting it with an R-Hop, hop up chamber and upgraded inner barrel for improved range and accuracy. This build is primarily tuned for rapid semi-auto response and CQB sites where there are restrictions on full auto use. With the quick-change main spring, it can easily be configured to compete on the field with its excellent range and above-average full auto. Thusly, the “Wolf Mod” moniker stems from the fact that no external aspects are changed, making it otherwise outwardly indistinguishable from a stock rifle... making it a real wolf in sheep’s clothing!

### The Heart of the Matter

Disassembly of the MCX Virtus is nearly on par with any of VFC’s other Version2-based offerings and will be eminently familiar to those who’ve worked on such before. The one feature of this particular design I can really appreciate, is the fact that the quick-change spring guide is accessible without having to remove the gearbox; rather, one simply unmounts the stock via a single screw and the spring guide is visible and ready to be accessed. VFCs are among some of the easiest and best AEGs to upgrade; the tolerances are excellent and consistent throughout.

The first step of upgrading this MCX will be prepping the gearbox for the TITAN installation. This may seem slightly backwards to some, as most start off with a proper re-shimming of the gears, but this step requires some filing which generates metallic dust and is best accomplished without the internals in the way.

Taking the right gearbox shell half, we will start with filing flat the metal posts that normally keep the wires pressed down into their channels. As this is a front-wired installation, it is actually only really necessary to remove one of these posts, but I always follow suit with removing all of them to “future proof” the gearbox, should it undergo a configuration change. Since we’re in the midst of generating filings, this is also a good time to radius the front edge of the gearbox as well. This assists in reducing the chances of the gearbox cracking from the impact of the piston slamming forward on every shot. Lastly, and as a small extra touch, I elected to polish the piston guide rails. This helps to smooth up the piston track and improves efficiency by reducing drag.

Now we can move onto the shimming stage. As this gun will be receiving a new motor, it will be necessary to properly re-shim the gears. I have selected the excellent ASG Infinity 22K Neodymium motor for this application. I always shim pinion-to-bevel, so we will first be installing the motor into the motor grip, ensuring the motor plate is attached too. ASG motors are taller than VFC, so this step is also necessary to obtain the correct motor-to-bevel height.

On the subject of gears, we will be using a set of SHS 13.65:1 ratio CNC gears. SHS sets are an excellent value for the money and have generally proven themselves to be quite durable, provided you don’t draw the Chinese Lottery. As mentioned previously, this gear and motor combination will produce an excellent semi-auto response with an above average full auto. To meet the UK’s strict 350 FPS criteria, I will also be short stroking the sector gear by three teeth. Aside from reducing FPS (approximately 10 – 15 FPS per tooth removed), short stroking can help increase your cycle time and eliminate PME (Premature Engagement) risk; the latter is not really a concern on this particular setup, however.

After all the shimming is done, one can now install the Gate TITAN, taking care to correctly lay out the wires in a manner that will prevent the motor pinion from slicing through them on reassembly.

One of the things I really like to pair with the TITAN is the new MAXX CNC tuneable flat triggers. These allow you to fine tune your over-travel adjustment point and, coupled with the adjustable trigger sensitivity on the TITAN, you can easily obtain a highly reduced trigger pull. All of which assists in faster follow up shots; further enhancing what we essentially call a “semi-auto spam build.” For the MCX “Wolf Mod” John chose not to have this

option fitted.

The work is not yet done though! Moving onto the compression side, we'll be installing a new CYMA FMR piston, Lonex POM ported piston head, Lonex double O-ring aluminium cylinder head and a 70D Air-Pad for AOE correction. The main goal here is to replace the OEM components with more durable aftermarket analogs and improve the FPS consistency – a key facet of maintaining tight groups and accuracy.

While CYMA is not especially known for being "high end" (and even "mid-tier" might be debatable), their FMR pistons are a true diamond in the rough. I have not yet managed to break one of these in all the years I have been using them. I've even had one outlast a Siegetek DSG sector on a 70 RPS build! Truly amazing pistons. These require some preparation before use, however.

The flimsy piston head and heavy weight they come equipped with out of the packaging will be discarded. The rack is removed from the piston body and will have the 2nd from last tooth removed for

AOE correction and three teeth removed up front for the short stroking modification. Lastly, the rack will be epoxied in place and the piston body "swiss-cheesed" for some weight reduction. The Lonex POM piston head will be installed with the bearings removed for further weight

reduction.

On the Lonex double O-ring aluminium cylinder head, the stock rubber pad is removed and replaced with a 3/16 70D Gen. 2 Air Pad. These are a superior grade material to the more common Sorbo pads and do not take on a set over time either. They've well-proven themselves to stand up to the rigors of even the most aggressive builds.

VFC tappet plates are somewhat infamous for being brittle and prematurely breaking. The newest type are moderately improved, but still benefit from a high quality tappet plate that's not going to break anytime soon. My preference is for the ASG Ultimate series tappet plates as they have excellent quality control, fit and finish and also

secure most air nozzles quite well.

Now that we are done configuring the gearbox, we can lubricate the components

with Super Lube synthetic grease, taking care not to over-lubricate for the sake of the optical sensors on the TITAN and close the shell up!

### FAST IS FINE BUT ACCURACY IS FINAL

The final component of the Wolf Mod upgrade will be to upgrade the barrel and hop up

components. I've largely switched all custom builds entirely over to Lambda One barrels. These are 6.01 diameter bores made from cold forged SUS304 stainless steel and finished out to within 1 micron of straightness. Surprisingly, they are equivalent in

cost to Prometheus but with a much-improved hop up window cut and have demonstrably superior accuracy and are daresay (sacrilege!) on par with the top tier PDI and EdGI offerings.

A quality barrel is only as good as the work done on the hop up side, however, so that's where an R-Hop installation comes into play. An R-Hop is a handmade contact patch that fits into the hop up window of the inner barrel and provides a dramatic increase in surface area contact with the BB. You will see a marked improvement in range with an R-Hop, especially when used in conjunction with heavyweight BBs. The best part is an R-Hop will last indefinitely. I have personal examples well in excess of a decade of use without fail.

An R-Hop requires that one take a conventional bucking and "flat hop" it. This consists of removing the inner mound via careful sanding to obtain a perfectly flat surface. Here the excellent Prometheus purple bucking steps in for modification. The Prometheus purple is also a great choice for an all-weather bucking; that is to say, it does well in both hot and cold climates.

### AND FINALLY

The last component will be to upgrade the hop up chamber. By design, the MCX will only accept a rotary style chamber, but the available options pare down significantly due to a restriction on the height of the hop up arm area. Some MCX owners have also remarked that the MCX is a bit unforgiving on magazine selection, which is partly due to the feed nozzle height on the VFC hop up chamber. Owing to all of the above, we will be using the MAXX ME Pro rotary hop up chamber. The MAXX chamber has a CNC milled construction and uses a true "top down center" style hop up arm assembly. It is, in fact, purpose built with R-Hops in mind. Thus, it is a perfect accompaniment to this setup. **AA**

### SPECIFICATIONS

- Lambda One 6.01 SUS304 stainless steel inner barrel
- MAXX ME Pro rotary hop up chamber
- Prometheus purple bucking
- R-Hop w/M-Nub
- Lonex double O-ring aluminium cylinder head
- 3/16 70D Gen. 2 Air Pad
- Lonex POM ported piston head
- CYMA FMR piston, AOE corrected and swiss-cheesed
- ASG Ultimate tappet plate
- SHS 13.65:1 ratio gerset, short stroked 3 teeth
- Retro Arms 9mm bushings
- ASG Infinity 22k Neodymium motor
- Gate TITAN Advanced (front wired)

