

**THE LOWDOWN
THE AWS RAPTOR
V2HC-X100 MOSFET**

- FEATURES:**
- Solid-state switching.
 - Active braking.
 - Full-cycle completion.
 - Programmable burst fire.
 - Optional DMR mode with pre-cocking.
 - Programmable Rate of fire.
 - LiPo monitoring.
 - Trigger jam prevention.
 - Surge and over-current protection.
 - Thermal management.

- **PRICE:** \$90
- **CONTACT:** WWW.AWSAIRSOFT.COM

- **EASE OF INSTALLATION:** 8/10
- **PERFORMANCE:** 9/10
- **VALUE FOR MONEY:** 9/10
- **Ai TOTAL:** 26/30

AWS RAPTOR MOSFET

IS THIS THE FUTURE OF AIRSOFT?

MOSFET TRIGGERS ARE NOTHING NEW, BUT ONE THAT'S FULL-FEATURED AND DROPS STRAIGHT INTO A V2 'BOX CAUGHT OUR EYE...

WORDS & PHOTOS BY JACK

Contrary to what some would have you believe, the average airsoft gun is actually pretty simple - three gears, a spring, a piston in a cylinder, and a motor controlled by a fairly rudimentary switch. There's nothing really bad with this setup, but we all like to tinker, and more powerful motors introduce higher currents, which can increase the wear on the switch contacts. As the spade contact inside enters two blades, arcing naturally occurs which gradually burns the copper contacts and reduces the conductivity.

A MOSFET (or Metal-Oxide-Semiconductor Field-Effect Transistor) takes that current away from the switch. In most traditional 'FETs, which are wired outside the gearbox, two slim wires go to the switch and carry a low-current signal voltage. As soon as the switch is closed by

pulling the trigger, the signal tells the transistor to open its gate, and allow power to the motor - very fast, and very positive.

As MOSFET design has progressed, Active Braking (AB) has been introduced. When the trigger is released (by your finger, or through the semi-auto cut-off lever), the switching 'FET closes its gate. At the same time, a second 'FET effectively shorts the motor out (this isn't the same as shorting the battery, or powering the motor in reverse), stopping it dead. The advantage to this is that, especially in high-speed set-ups, the motor doesn't spin on once power is removed, leaving the gearbox in the perfect position for the next shot, and eliminating the lock-ups that can happen in V2 boxes when the cut-off lever is stopped in just the wrong place.

WHAT'S SO SPECIAL ABOUT THE RAPTOR?

In guns with large stocks (like the M16), it's relatively easy to wire a MOSFET in and chuck it in with the battery - some soldering skills are needed, but that's about it. The problem comes when you're simply running out of space... I've wanted solid-state switching in my G&P VLTOR M4 for a while, but wasn't sure I'd be able to cram a MOSFET into the tube of my Magpul UBR stock. This is the main selling point of the Raptor - with very little work, it drops straight into a standard Version 2 gearbox (including ICS).

While AWS's Stealth MOSFET, which also drops into a standard V2 box, has been available for quite a while, it only gives trigger switching, with none of the additional features of the Raptor like active braking and

programmable control (although it does feature low-voltage cut-out, as well as surge, over-current and thermal control).

IN USE

Once fitted, the first trigger pull brings with it a huge grin - trigger response is suddenly very sharp, with the motor snappily winding back the piston and letting off the shot. It doesn't matter how you tap the trigger, a full cycle is always completed. This means you can pull it as fast as you like, and the gearbox will keep up, never stuttering or missing like it would before. Cycle completion also applies in full-auto, so when you do let go of the trigger, the 'box will stop in the perfect position for the next shot, regardless of weather it's to be in semi- or full-auto. Don't expect higher RoF full-auto bursts unless your original trigger was really worn out - at best I saw half a round per second increase (based on audio recordings of the gun before and after fitting), but this isn't really designed for those who plan on sitting with their finger held, emptying hi-cap mags into the bushes. During bench testing, with multiple rapid single-shot firing, I noticed my battery and motor warming up more than usual, but for typical tactical game play I don't expect this to be an issue.

But what about the programmable features? The burst fire mode is a great addition - a quick tap of the trigger reliably fires off exactly three shots, using the cut-off lever as reference (unlike the timing system employed by some MOSFETs and the new ICS MX5 Pro). Burst can be set up to run as Safe-Burst-Auto or Safe-Semi-Burst, and if total realism isn't an issue, you can

also have burst fire at the auto position, with full-auto when the trigger's held.

Pre-cocking has the piston stop most of the way back, then winding back for the next round. This works, but I found the difference negligible in my gun. The other programmable feature - Rate of Fire, allows you to lock the gun to 20, 15 or 10rps by pausing between each shot. This works well, and maintains a snappy but controlled rate of fire, although the first two shots always sound a little faster before it settles to the correct speed, very slightly spoiling the illusion.

What I did find very important was that the motor was clean - at one point the Active Braking featured failed on my gun, but having checked the supplied instructions and cleaned the armature and brushes, it was fine again. Definitely something worth keeping an eye on...

CAN ANYONE FIT IT?

As you can see from the panel, fitting is fairly simple if you're confident in opening your gearbox. The only modification needed is to the selector plate (when you cut the piece out, be careful not to split it like I did by just pushing the knife straight in!). This is the latest version of the Raptor, which uses thinner wires than the previous model - this makes a huge difference to the ease of fitting, and is testament to AWS's willingness to modify their product to ensure it's the best it can be. They've also extended the wiring over the original, meaning you can drop this in with no soldering skills. A mini Tamiya connector is supplied - I swapped this to a Deans, but the

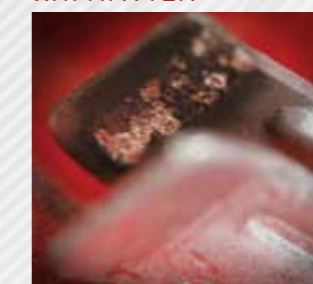
choice makes sense - those who can solder will be happy to fit a Deans, but those who can't will probably still have Tamiyas on their gun.

SHOULD YOU GET ONE?

If space is tight, and you want a full-featured MOSFET-based trigger switching system for your gun, I'd definitely recommend the AWS Raptor. If you still enjoy running through several hi-cap mags in a game (nothing wrong with that if it makes you smile), you'll not really see a benefit to this or other 'FETs, but if you're a tactical player, who mixes full-auto bursts with volleys of single-shot precision, fitting one is well worth the effort.

Longevity is impossible to judge at this stage, but I'll be running this gun at pretty well every game I go to, so expect updates in future staff-shooters - it's a well made, and well thought-out piece of kit, so I'm not expecting any problems.

WHY FIT A 'FET?



I considered the trigger switch on my G&P to be in good condition when I removed it, but check out these close-up views! One of the blades, along with one side of the spade are clearly burnt, while the 'good' side shows clear score marks where I cleaned it with fine emery paper on the last strip-down.

STOP PRESS!

AWS no longer supply the public direct, but by the time this issue hits the shelves, they should have announced their dealer network, which should speed up delivery and development times no end. I'm certainly looking forward to a V3 Raptor for my little MP5K...

Ai SIMPLE STEPS...
FITTING YOUR RAPTOR

- 1 Remove the single screw holding the trigger mechanism in place, then pop it out.
- 2 Remove the small post from the gearbox too.
- 3 Take out the safety lever to allow the selector plate to come out.
- 4 Trim a small section of the selector plate off, as shown in the instructions.
- 5 Screw the Raptor into place, poking all the wires home carefully.
- 6 Refit the trigger (after bending the end of the spring straight), and check it mates correctly.
- 7 Refit the selector plate with the new (supplied) spring, along with the safety lever.
- 8 Before reassembling, make sure no wires are going to be trapped!

