

17 NEXT-GEN
SUPPRESSORS

LIGHTS, LASERS
& THERMALS GUIDE

RISE OF THE
KILLER ROBOTS

TACTICAL LIFE

2021
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JAN./FEB. 2021 

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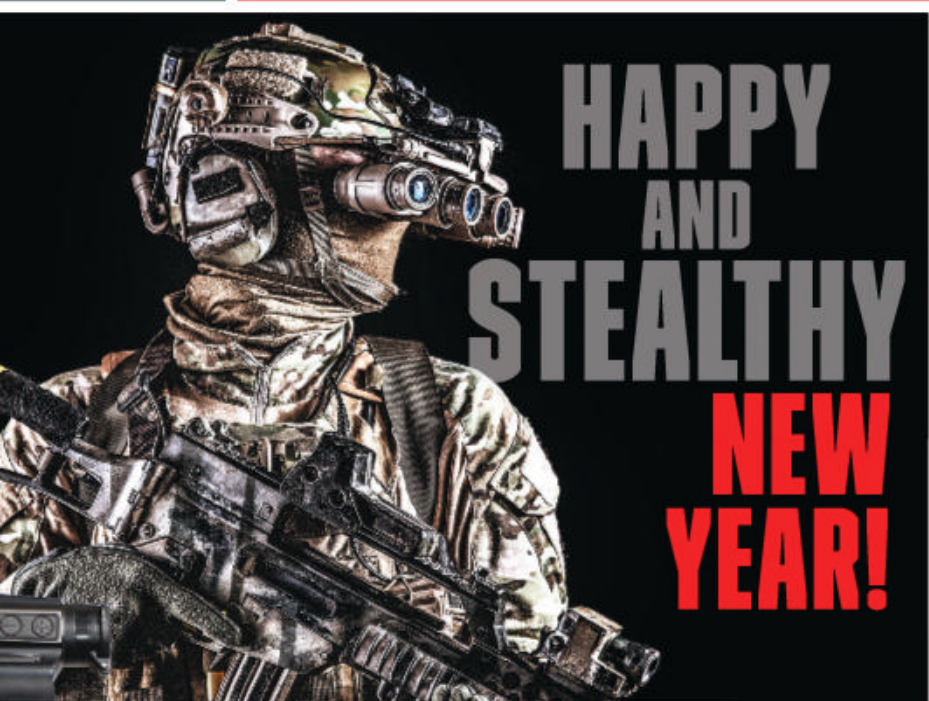
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Maybe we can all remember when Christmas was exciting. Like most kids, I remember the anticipation of the presents under the tree and waking early to tear into a pile of Santa stuff. These days, that feeling of excitement has been replaced with a watered-down version when I get a text message from the local Class III dealer that my latest silencer acquisition got out of “ATF jail.”

I wanted to put together a SHTF rig in 5.56, so I went the easy route with a Ruger AR-556 pistol with a 10.5-inch barrel. It’ll get the obligatory red-dot optic, light and laser and a petite can before it can go out and play.

The perfect fit for this rig is a Yankee Hill Machine Turbo K suppressor, which just came home after a several-month stay at a local FFL/SOT dealer. Its overall length measures 4.75 inches and

it weighs in at 8.83 ounces. Adding YHM’s Phantom Q.D. adapter, the overall length grew to 5.5 inches and weight increased to 11.7 ounces. According to the manufacturer, the Turbo K has an average sound pressure level of 138 dB launching 55-grain bullet from a 16-inch barrel. It is rated to handle pressures from a 10.5-inch barrel, which just happens to be the length of the Ruger AR-556 pistol barrel. I’ve run this weapon with and without hearing protection for comparison, and it is much more comfortable to shoot with some “ear pro.”

My “Christmas present” YHM Turbo K utilizes a tube-

CORRECTION: On page 110 of the DESAKNATED Marksman story in the December issue, the chart was labeled, “Velocity.” That should have read, “Accuracy.”

less design made from heat-treated 17-4 stainless steel along with a heat-treated 718 Inconel blast baffle. The combination of these materials allows the suppressor to be full-auto rated. The blast chamber of the Turbo K is threaded to the popular 1-3/8-inch x 24 TPI thread, which allows it to utilize many available mounting options currently on the market. The early-version Turbo K I got has the smooth, round muzzle end, but the latest version has a notched rim and tri-port muzzle end cap. It also comes with a 1/2-28TPI adapter for direct muzzle attachment.

The Turbo K has an MSRP of \$485, which includes the Phantom Q.D. adapter, two suppressor wrenches and a Q.D. muzzle brake. The Turbo K was created to supply the modern suppressor community with a full-featured suppressor at an affordable price.

Thus far, the Turbo K does its job and keeps a sub-MOA gun shooting tight groups.

And, while you are thumbing through this special Stealth edition of *Tactical Life*, I’ll probably be somewhere cold with the aforementioned Turbo K can attached to a longer-barreled 5.56 varmint rig. I’ll have a predator call hanging around my neck, too, and inviting any willing coyotes for a ride in the old GMC meat wagon.

We’ve got a wide variety of solid info on new silencers, night vision and more in pages to come, so take this copy home so you can stay on Santa’s “nice list” this year. —Jay Langston

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ABOUT THE COVERS: On our subscriber cover, we have an operator fielding a BCM RECCE-11 AR Pistol with Steiner’s new CQT. Also pictured: An OpsCore FAST Hi-Cut Ballistic Helmet covered by Spiritus RAID, SureFire M300V Pro, Princeton Tec Charge MPL, Wilcox G24 Mount, AN/PVS-15 goggles, ACTinBlack lens covers, OpsCore AMPS Ear Pro, Oakley M Frames, Crye G3 Combat shirt, Outdoor Research Ironsight gloves, Garmin Fenix 5X, Arbor Arms FLEX Assaulter Plate Carrier with Tradesman Assaulter pack and Velocity Systems plates. And a partridge in a pear tree. The USA cover features a Taurus Raging Hunter topped with a Sector Optics T20 thermal.



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THE STEALTH ISSUE

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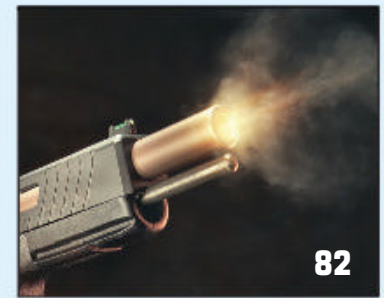
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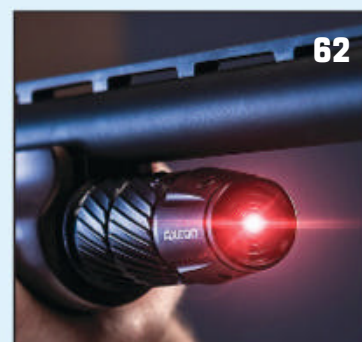


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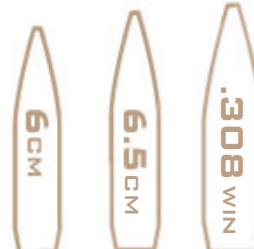
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GEAR

NEW AND
NOTEWORTHY
TECH FOR
OWNING
THE NIGHT

BY JAY LANGSTON



ACCUFIRE NOCTIS V1

← Accufire Technology's Noctis V1 is a 1-16X magnification digital riflescope with an ultra-bright screen that is dimmable to 1 percent, and HD-quality night vision. The Noctis V1 quickly sights in like a traditional scope, and easily stores presets of ballistic solutions for a library of different firearms and ammo types.

The Noctis V1 can also be set to record HD footage—regardless of available light—and offers the advantage of built-in Wi-Fi for shareable streaming through a cell phone. (accufiretech.com)

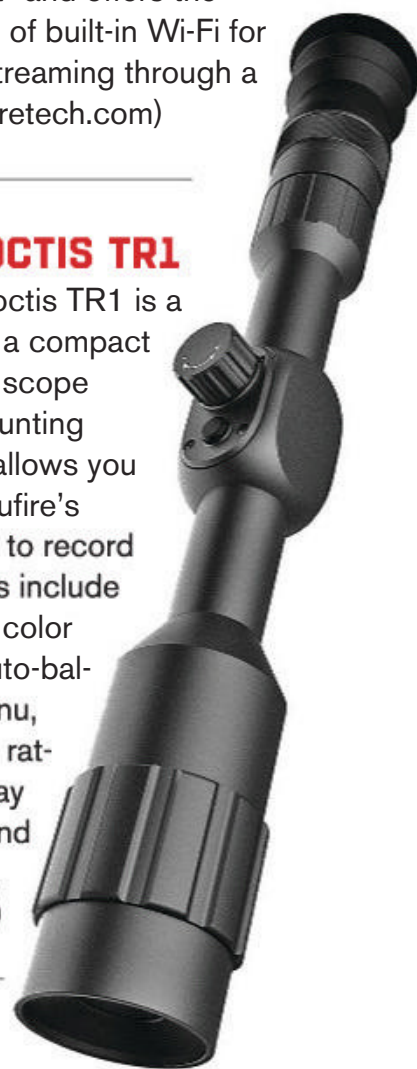
ACCUFIRE THERMAL CLIP-ON

↓ Accufire Technology's Thermal Clip-On is a compact thermal optic delivering superior image quality in a modular package. The Thermal Clip-On can operate as a handheld tracker or a forward-mounted clip-on to any traditional scope. (accufiretech.com)



ACCUFIRE NOCTIS TR1

→ The Accufire Noctis TR1 is a new optic offering a compact digital night-vision scope with traditional mounting options. The TR1 allows you to utilize all of Accufire's built-in technology to record your hunt. Features include smart rangefinder, color correction tech, auto-ballistics, intuitive menu, unparalleled recoil rating and a wide array of HD recording and streaming options. (accufiretech.com)



AGM GLOBAL VISION PYTHON-MICRO TS35-134

→ AGM's Python-Micro TS35-134 thermal imaging riflescope was developed for hunters and shooting enthusiasts. Python-Micro TS35-134 has a 35mm objective, which offers short-range operation. This lightweight, compact thermal scope offers the highest resolution, crispest display and highest-spec'd thermal core on the market for its price point. (agmglobalvision.com)





AGM PYTHON-MICRO TS50-384

← AGM's Python-Micro TS50-384 thermal-imaging riflescope was developed for hunters and shooting enthusiasts. The

Python-Micro offers a 50mm objective lens for medium-range use. Lightweight and compact, this dedicated thermal scope offers the highest resolution, crispest display and highest-spec'd thermal core on the market at its price point. The TS50-384 is powered by two CR123 batteries, and has a five-hour operating range. (agmglobalvision.com)



AGM NVG-50

↑ The AGM NVG-50 is a dual-channel night-vision binocular system with a 51-degree field of view. It provides a large visual field without needing to move the binoculars. The NVG-50 uses advanced multi-coated optics and is built to last with a compact composite housing. The device can be outfitted with either a Gen 2+ or Gen 3 high-performance image intensifier tube (IIT). The bright-light cutoff feature ensures that the high-quality photocathode tube is protected. And it's equipped with an integral infrared illuminator for reading in the dark. (agmglobalvision.com)

AGM VICTRIX TC38-384

→ This compact system allows quick transformation of day optics into thermal-imaging devices. It sports a 38mm objective, and mounts to the front of any daytime scope. It has a high-resolution display, stadiametric rangefinder and 2X digital zoom and is powered by two CR123 batteries for 44 hours of run time. An optional video recorder can be attached via a USB port to record video, or to an external Wi-Fi module to connect with smartphones. (agmglobalvision.com)



AGM VICTRIX TC50-384

→ The AGM Victrix TC50-384 Thermal Imaging Clip-On is a compact system allowing quick transformation of day optics into thermal-imaging devices. Offered with a 50mm objective, it mounts to the front of any daytime scope. Superior clarity, versatility and reliability are benefits of this medium-range optic. Its high-resolution display is powered by two CR123 batteries. (agmglobalvision.com)



AGM ASP TM35 MONOCULAR

↑ AGM's ASP TM35 handheld observational thermal monocular is equipped with a 384x288 or 640x512 infrared detector and a 1024x768 OLED display. It supports functions of observation, hot spot tracking, distance measurement, Wi-Fi and more. The high-sensitivity built-in thermal detector provides you with a clear view even in total darkness. (agmglobalvision.com)



AGM PYTHON

↓ The AGM Python is a long-wave infrared, uncooled, thermal-imaging riflescope designed for 24-hour operation, eliminating the need to dismount the unit from the rifle. The housing is made of high-grade aircraft aluminum alloy, making it lightweight but at the same time tough enough to tolerate high recoil. The waterproof design of the AGM Python provides excellent performance even under severe environmental and weather conditions. The Python's user-friendly interface and comfortable and ergonomic buttons, together with a wireless remote control, make adoption and application incredibly simple. (agmglobalvision.com)



EXCELITAS TALON

→ The Talon fused weapon sight provides the dismounted close-quarters user with an enhanced, multi-waveband Detect, Recognize & Identify capability. The Talon is a fully qualified military weapon sight designed specifically for short- and medium-range surveillance and target engagement. This unit combines the latest image intensification and uncooled thermal imaging capability in a single lightweight, compact yet rugged package. Talon is fitted with a 12µm, 60Hz uncooled thermal sensor coupled with a near silent shutter, delivering class-leading sensitivity, uniformity and system latency. It's operated by just two standard lithium AA batteries. (excelitas.com)



WANNEY GEN II NIGHT VISION GOGGLES

→ Check out this set of Gen II Night Vision Goggles. The integrated binocular has a useful range from 16 to 197 feet (5 to 60 meters) in full dark. Battery life for its internal rechargeable unit is six hours. (wanney.com)



XS RAM NIGHT SIGHTS

→ XS RAM Night Sight features a traditional three-dot tritium, notch-and-post sight picture. The rear is blacked out to increase contrast against the front sight. The front sight is available in orange or green and is equipped with XS's Ember Glow Dot Technology. Ember absorbs ambient light and glows in low light. The front tritium lamp charges the Ember dot, making the front sight glow brighter than the rear, keeping focus downrange. RAM sights are the brightest options for fast and accurate shooting in bright and low light. (xssights.com)



WANNEY GEN II PLUS NIGHT VISION SCOPE NVE-E50-II



← Wanney Corporation is a Chinese company. New to the market is their Gen II Plus Night Vision Scope NVE-E50-II. It has a range of 920 feet (280 meters) in full dark, an optical rangefinder, e-Compass and trajectory calculation. It can record 1080p@25Hz, has image capture of 1080p and is Wi-Fi capable. Apps are available to sync it with your iPhone or Android phone. (wanney.com)

WANNEY NIGHT VISION BINOCULAR TELESCOPE

↑ Wanney's Night Vision binocular telescope comes with a 4.99-inch viewing screen. In full darkness, this unit is capable of recognition from 16 to 1,640 feet (5 to 500 meters). This handheld unit will run for five hours on a single charge. (wanney.com)





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LUNA OPTICS LN-G3-M50 GEN-3 DAY/NIGHT MONOCULAR

↑ The Luna Optics LN-G3-M50 Gen-3 day/night monocular is in their Flagship Series, and offers the company's best digital night-vision technology. State-of-the-art widescreen AMOLED-Q display achieves brilliant resolution and contrast. On-board Blu-ray-quality video recording, 12.2 MP still image camera and quick transition between full-color, black and white and night-vision green images make this monocular a welcome 24/7 companion. (lunaoptics.com)

WANNEY MONOCULAR TELESCOPE

→ Wanney also produces a monocular telescope with a full-dark range from 16 to 197 feet (5 to 60 meters). It is powered by an internal rechargeable battery with a six-hour run time. (wanney.com)



FULL MOON OPTICS GENESIS DOMINUS D-80

↓ The Dominus D-80 features ultra-high resolution 1024x678 micro-OLED dual image displays, thermal sensor with shutter-free and NUC-free technology and integrated 4,920-foot (1,500-meter) laser rangefinder provides reliable and fast distance readings. Also features on-board 32GB video recording and Wi-Fi data streaming. The D-80 model offers 6-24X image magnification. Detection range is 2,200 yards. (fullmoonoptics.com)



FULL MOON OPTICS GENESIS REVELATION

↑ Size things down with the compact thermal monocular with a built-in laser rangefinder. Its proprietary Genesis hybrid thermal core with industry-first image detail enhancement and manual DSP removes the barriers between 384 and 640 resolution thermal sensors. The controller allows instant multiple image adjustments without having to access complicated menus. An ultra-high-resolution 1024x678 micro-OLED image display and 2.5-10X image magnification and many other features highlight this unit. Detection range is 1,100 yards. (fullmoonoptics.com)

FULL MOON OPTICS GENESIS DOMINUS D-55

→ Genesis's hybrid thermal core Dominus D-55 offers industry-first image detail enhancement. The unit's manual DSP removes the barriers between 384 and 640 resolution thermal sensors. The Super Controller allows instant multiple image adjustments without having to access complicated menus. Features such as ultra-high-resolution, 1024x678 micro-OLED dual image displays, thermal sensor with shutter-free and NUC-free technology and an integrated 3,940-foot (1,200-meter) laser rangefinder provide reliable and fast distance readings. The on-board 32GB video recording and Wi-Fi data streaming make this an excellent unit. Detection range is 1,500 yards. (fullmoonoptics.com)





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barrett.net



NEXT-GEN CANS

A COLLECTION OF THE NEWEST AND MOST NOTABLE SUPPRESSORS TO HIT THE MARKET

BY FRED MASTISON

CGS GROUP

1. Siren 22: Designed and manufactured in Artesia, New Mexico, by CGS Suppressors LLC, the Siren 22 utilizes second-generation Orion baffles for the best available sound reduction. A heat-treated 17-4 PH stainless steel mounting insert is used to prevent thread fouling. End caps and baffles shield the tube using a tapered interface, preventing carbon and debris fouling by containing the blast within the baffle stack and allowing easy maintenance. Standard mount is 1/2x28 threads per inch. The Siren 22 comes with a disassembly tool for maintenance. (MSRP: \$399; cgsgroup.com)

CMMG

2. DefCan 9: The DefCan 9 is a well-made, full-auto-rated 9mm rifle suppressor. It's available in Bi-Lock QD, making it compatible with most 9mm rifles on the market. It's made of 7075 aluminum and reduces sound by 32 dB to make your rifle hearing safe. The DefCan 9 is a sealed can that requires no maintenance or cleaning and is backed by CMMG's lifetime guarantee. (MSRP: \$700; cmmginc.com)

3. DefCan 2 Ti: The DefCan 2 Ti is a full-auto-rated 5.56 suppressor that offers 32 dB of sound reduction to quiet one's rifle



to a comfortable sound level. The blast baffle is made of Inconel, while the rest of the can is constructed of titanium, making the DefCan 2 Ti both lightweight and extremely durable. It is available in either a Bi-Lock QD or direct-thread configuration and is backed by CMMG's lifetime guarantee. (MSRP: \$825; cmmginc.com)

4. DefCan 3 Ti: The DefCan 3 Ti is a lightweight, 7.62 suppressor that delivers an impressive 32 dB sound reduction to quiet one's rifle to a comfortable sound level. Its rugged, all-titanium construction delivers weight savings, durability and heat tolerance that allow the DefCan to be the workhorse suppressor for any .30-caliber rifle. Available in either direct-thread or quick-detach configurations, the DefCan 3 Ti is the perfect choice for any bolt gun or semi-auto rifle and is backed by CMMG's Lifetime Guarantee. (MSRP: \$899.95; cmmginc.com)

5. DefCan 22: Rimfire suppressors are fun to use and great for those looking for their first can. CMMG's DefCan 22 suppressor amplifies the fun factor with 40 dB reduction in sound. Weighing just 2.7 ounces, the DefCan 22 is extremely lightweight. Its small frame adds very little length to the end of your rifle. Available for an economical price, the DefCan 22 offers an impressive value and is backed by CMMG's lifetime guarantee. (MSRP: \$325; cmmginc.com)

DEAD AIR SILENCERS

6. Nomad-L: The Nomad-L is built with 17-4 stainless steel and Grade 5 titanium. Like the Nomad-30, it features an improved, high-efficiency baffle design with industry-leading sound reduction at the muzzle and minimal first round pop. It ships in its direct-thread configuration with 5/8x24 threads. With high-pressure cartridges, the Nomad-L shines. The Nomad-L delivers class-leading performance with lower-pressure calibers, but the performance undoubtedly reigns supreme when used with higher-pressure calibers. At only 8.82 ounces, the Nomad-L remains agile enough for



multiple platforms and hosts. (MSRP: \$1,065; deadairsilencers.com)

ENERGETIC ARMAMENT

7. Lux: The Lux Titanium Rifle Silencer is a lightweight, precision-engineered rifle suppressor. The core is welded to AWS standards from U.S. origin, DFARS compliant, 6Al-4V titanium. The Lux suppressor is 7.9 inches in length, weighs 8.82 ounces and features a seven-baffle core with the patent-pending serial ID ring. This serial ID ring allows quick factory replacement of the core should damage ever occur, without any loss of alignment or concentricity. The suppressor utilizes the industry standard 3/8x24 mount thread pattern, allowing an extremely wide range of mount options including Energetic Armament's own Centrix mount. (MSRP: \$1,090; energeticarms.com)

INNOVATIVE ARMS

8. IA-SC9 and IA-SC9-K: The IA-SC9 transforms the popular CZ Scorpion EVO 3 into the perfect shooting experience. It's industrial strength, rugged, sweet to your ears and gives subsonic velocities with high-velocity ammunition. The integral is



user-serviceable, with the baffles numbered for easy reassembly, and comes with the HB Industries 6.84-inch hand-guard kit already installed. All the M-LOK slots on the bottom can be used and all of the side slots can be used except for the front two slots of both rows. It is offered as a complete integral pistol or as an integral suppressor kit that you install on your personally owned Scorpion. (MSRP: \$1,900; innovativearms.com)

THUNDER BEAST ARMS (TBAC)

9. Dominus-SR: The Dominus-SR is Thunder Beast's high-performance, hard-use/full-auto 5.56mm and .30-caliber suppressor. It is a true lightweight "Go To War" suppressor and is perfect for 5.56 assault rifles and .30-caliber battle rifles, including SBR variants. It retains the accuracy and repeatability TBAC is known for. The 6.95-inch Dominus-SR meters at 137 dB) and 126 dB at the shooter's ear on a 20-inch .308. The Dominus-SR features their "SR" quick-attach/detach mount to provide secondary retention during hard use and heat cycles, and precision rifle-level accuracy. (MSRP: \$1,495; thunderbeastarms.com)





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10. Dominus-CB: This suppressor is based on the Dominus-SR but uses the CB mount. The Dominus-CB features Thunder Beast's "CB" mount system for interoperability with all CB muzzle devices, for users who have other Ultra series suppressors. The Dominus-CB is shorter but fatter than the Ultra series, and about the same weight per volume. It is 6.25 inches long and 1.8 inches in diameter. The Dominus-CB itself weighs 9.6 ounces. The CB brake weighs a very reasonable 2.6 ounces. (MSRP: \$1,235; thunderbeastarms.com)



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12



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SIG SAUER

11. 9MM ModX9: New from Sig is the 9mm ModX9 suppressor. It is unique because it is 3D printed. It has a user-configurable modular baffle design and is constructed of titanium. It includes 1/2x28 TPI and M13.5x1LH pistons, and a fixed barrel spacer for use with carbines. It has 21 points of impact adjustment, and the unique exterior design doubles as wrench flats. It is lightweight, durable and everything we expect from Sig. (MSRP: N/A; sigsauer.com)



13



15



16



12. .45 CAL ModX45: Like the ModX9, the .45-caliber ModX45 is a modular, 3D-printed, titanium suppressor that allows end-users to utilize a full configuration of nine baffles down to a single-baffle configuration and everything in between. It includes 1/2x28 TPI and M13.5x1LH pistons, and a fixed barrel spacer for use with carbines. It has 21 points of impact adjustment, and the unique exterior design doubles as wrench flats. (MSRP: N/A; sigsauer.com)

SILENCERCO

13. Omega 36M: The Omega 36M is a light, compact, modular centerfire rifle suppressor with the versatility to use on magnum rifles, 9mm pistols and subguns. The Omega 36M comes in a two-piece modular design with a fully welded core, front and rear. The rear core contains Cobalt 6 and Inconel baffles, which provide extreme wear resistance under high heat and heavy use. The front core consists of a new lightweight 17-4 baffle



17

design to save weight while still providing high wear resistance. The titanium outer tube with lock ring prevents the tube from loosening and reduces weight. The 36M is finished with black Cerakote for a heightened level of durability. (MSRP: \$1,187; silencerco.com)

YANKEE HILL MACHINE


14. Resonator K: This .30-caliber suppressor was designed to provide a quiet, lightweight and cost-effective suppressor for the high-caliber shooter looking to shed some weight and reduce their footprint. The blast chamber is threaded to the popular 3/8x24 thread, which allows it to utilize many available mounting options currently on the market. The new end cap design helps to greatly reduce flash signature. The Resonator K can be used on rifle calibers ranging from .17 HMR through .300 Remington Ultra Magnum, making it one to take a good look at. (MSRP: \$589; yhm.net)

15. The Nitro N20: Enter the Nitro N20, YHM's newest iteration in their modular suppressor range, designed around the tactical shooter. Built with titanium, the suppressor achieves mission-specific modularity by providing the operator with a plethora of mounting options and the ability to choose a short or long configuration. The front cap can accommodate a user-provided rubber wipe that can drop suppression levels even further. The Nitro N20 is full-auto rated with subsonic ammunition, and will accommodate .17 HMR to 9mm and .308 Win. (MSRP: \$1,249; yhm.net)

16. R9 9MM: When YHM engineers set out to make a suppressor, they look far beyond the goal of just making the designated caliber quieter. They make it work across the board, so that shooters can enjoy versatility across their entire arsenal. This is all accomplished at a budget-friendly price, while still maintaining the rugged durability you've come to expect from YHM. This was the intent with the R9 9mm. The primary goal was a 9mm suppressor capable of handling high volumes of fire and the ability to run other calibers, such as

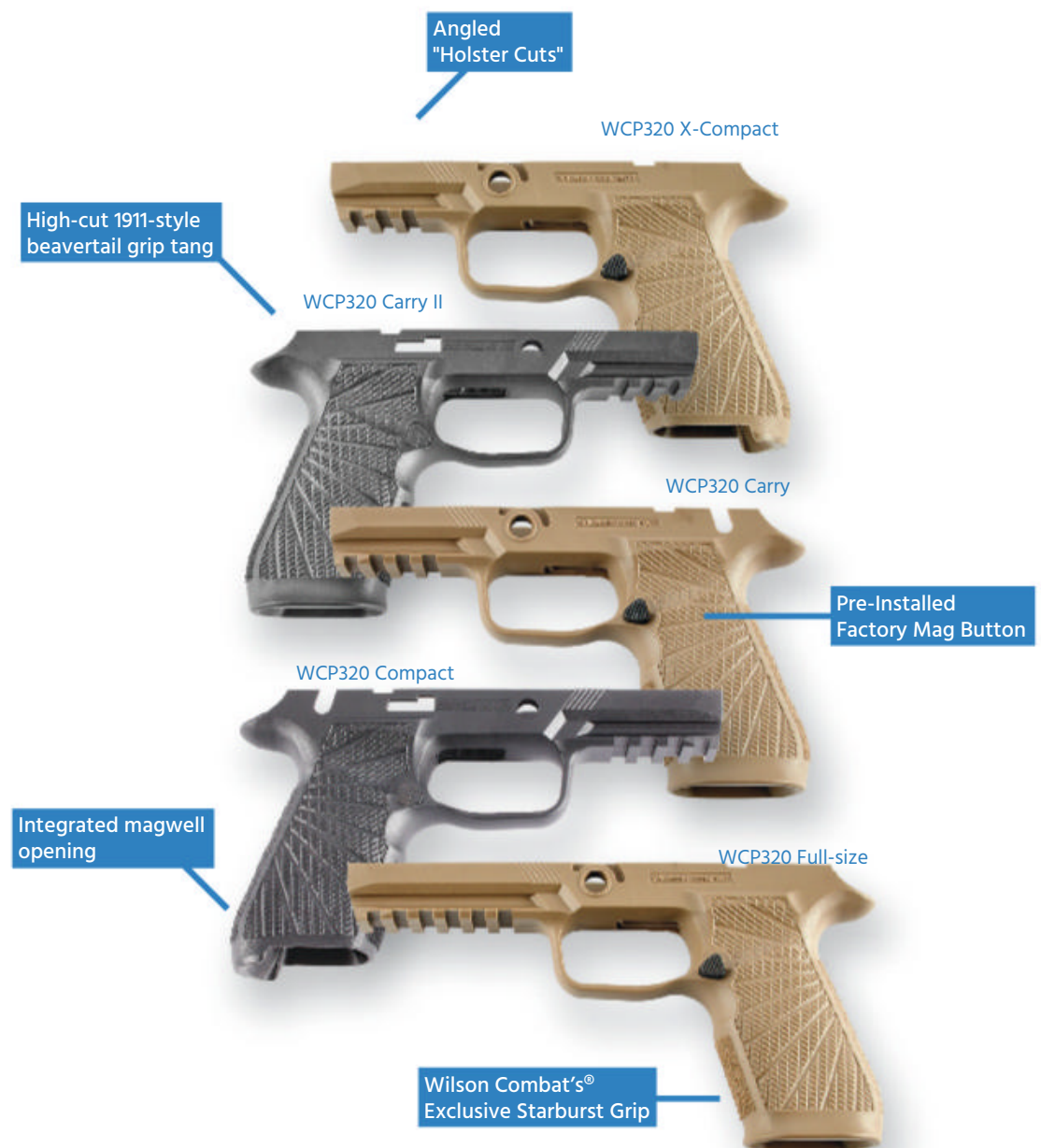
300 BLK and .308 Win. It was primarily focused on suppressing 9mm (specifically submachine guns and SBRs). (MSRP: \$449; yhm.net)

17. 5.56MM Turbo Integral Suppression System: Due to popular demand, YHM now offers a new Turbo Integral Suppression System. The Turbo Integral

comes with an integrated Turbo T2 suppressor, which is pinned and welded to a 10.5-inch 5.56mm barrel. With a combined barrel/suppressor length of just over 16 inches, this system requires only a single tax stamp to be purchased. It is the answer to the desire for a suppressed upper without too much NFA hassle or cost. (MSRP: \$1,415; yhm.net) 

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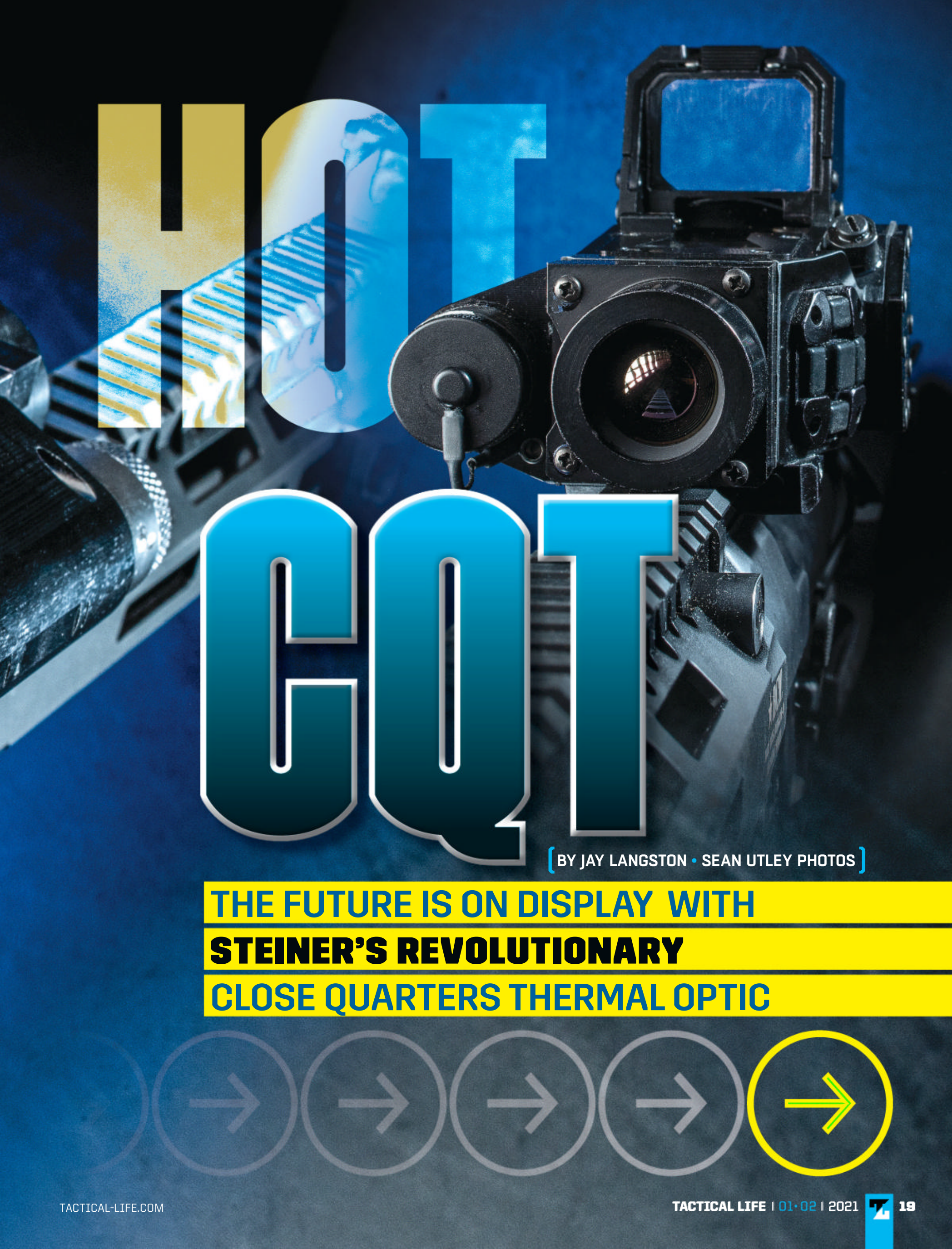
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HOT

CQOT

[BY JAY LANGSTON • SEAN UTLEY PHOTOS]

THE FUTURE IS ON DISPLAY WITH **STEINER'S REVOLUTIONARY** CLOSE QUARTERS THERMAL OPTIC





“THE SAME AFOCAL OPTICS AND LARGE VIEWING WINDOW OVERLAY THERMAL IMAGERY ON TOP OF THE OPERATOR’S DIRECT VIEW OF THE TARGET AREA.”

“PSST... WANT TO SEE SOMETHING COOL?”

WELL, THAT WASN'T EXACTLY HOW THE CONVERSATION STARTED, BUT IT WAS PRETTY CLOSE. I WAS TOLD TO MEET ATHLON'S EDITORIAL DIRECTOR IN A DIMLY LIT BARN IN AN OFF-THE-BEATEN-PATH PART OF MONTANA TO GO “EYES ON” WITH A TOP-SECRET OPTIC THAT STEINER STILL HAD IN ITS PROTOTYPE PHASE.

It was actually October 2018 during Athlon's Outdoor Rendezvous. We met with Steiner's top man to see their cutting-edge “Wraith” thermal sight. What set this unit—now released to the military and to law enforcement as the Close Quarters Thermal (CQT) Sight—apart was that the thermal image displayed an outline rather than blotting out the target.

Not until someone gets this unit in their hands and fires it up can the benefit be seen of displaying an outline of a thermal target rather than an obscuring blob. The fact that the optic was rather compact for a thermal sight, and that it could also be used in daytime as a red-dot sight made it that much more versatile.

A few months went by, and then a year, before I actually got the opportunity to mount a CQT on a rifle and put it to use. A few weeks ago a package arrived with a well-worn CQT inside that had seen the rounds with more than one evaluator. As a magazine editor, I was lucky to spend some time with this piece of equipment, and was grateful to get this unit for testing after a few men who regularly go into harm's way were finished with their own evaluations.

TECH SPECS

The Close Quarters Thermal (CQT) sight is a 1X magnification combination red-dot and fused thermal-imaging device intended for rifle mounting. It combines the functionality of a precision 2.5-MOA red aiming dot with a heads-up display thermal imager. Afocal

optics with a large eye box and long eye relief ensure the red-dot sight is always on target, regardless of eye position behind the sight. The same afocal optics and large viewing window overlay thermal imagery on top of the operator's direct view of the target area. To extend battery life significantly, the rotary switch must be in the “DOT” position.

The CQT's detector type is a 320x256 resolution, 12Dm pixels, uncooled VOx microbolometer. It provides long-wave infrared 8-14 μm Spectral Band, and the NETD is 60mK. Among the optical characteristics is an objective lens with 18mm focal length and 1X optical magnification. It is factory focused, with an effective range from 16.5 feet (5 meters) to infinity. The eye relief is 90mm at 12 degrees, with thermal HFOV and a fixed diopter. The eyepiece size is 32x23mm, which provides a field of view that is 12.2 degrees high and 9.7 degrees wide. The display provides a high-brightness OLED microdisplay, with SVGA that's 800x600. The unit weighs 584 grams with two CR123A batteries installed, and it measures 135x78mm wide and tall. In “merican,” that's 5.32 inches long, 3.07



sigsauer.com

SIG SAUER
NEVER SETTLE



→ The term “hardware” is a pretty accurate description for Steiner’s CQT thermal sight, since the unit is built battle-tough. It’s pictured with a BCM RECCE-11 topped with a SilencerCo Omega 36M.

inches wide, and the same tall. Weight is just 20.58 ounces.

As previously mentioned, two CR123A batteries provide an operating time of eight hours in thermal mode, and about 1,000 hours with only the red-dot sight illuminated. The operating temperature is between -40 and 158 F. It is shock rated to 1,000 Gs. The imaging frame rate is 60Hz, and the digital zoom give you a choice of 1X, 2X, 3X and 4X.

AMAZING VIEWS

Here’s where the Steiner CQT gets really interesting—the thermal modes toggle between off (of course) outline, full and gradient. The digital reticle can be toggled between a crosshair, crosshair plus dot, crosshair plus circle, dot, box dot and none, to allow only the thermal mode selected to be viewed.

The red-dot sight is 2.5 MOA, and is separately zeroed. According to the



“NO ADJUSTMENTS WERE NECESSARY TO KEEP THE RED-DOT SIGHT AND POI ALIGNED.”



An easy-to-manipulate rotary switch toggles between the battery-saving daylight dot model, the dot-thermal mode and, of course, the off setting.

manufacturer, the detection range for a human is 1,312 feet (400 meters), with recognition at 728 feet (222 meters) and precise identification at 475 feet (145 meters). My own home-grown ID range for this optic was being able to differentiate between deer at 150 yards. Under the cover of darkness, a herd of a half dozen deer routinely feed in the hayfield that is my front yard. While bucks were still in velvet and had a warm blood supply to their antlers, I could distinguish between bucks and does as they fed along the tree line 150 yards from my front porch. The red-dot sight can also be regulated between day and night use by raising and lowering a daylight filter.

The thermal mode must be used in the “advanced” setting to toggle among off, outline, full and gradient views of warm targets. This menu contains the parameters that configure each of the



Once the Steiner red-dot sight is zeroed it's just a simple matter to move the thermal reticle so it will co-witness with the red dot. The sight handled recoil very well, too.



thermal modes: outline, full and gradient. Outline mode is especially good at highlighting warm objects in the scene without obstructing the operator's direct view of them. Full mode improves the operator's ability to quickly detect warm targets in camouflage, hidden in brush or the tree line, or obscured by smoke or fog, without cluttering the sight with thermal imagery of the terrain and background. Gradient mode enables target detection and engagement and situational awareness in low-light and dark conditions. The thermal can also be turned off, making the CQT a high-performance red-dot sight with long battery life.

The windage and elevation adjusters

on the left side of the CQT adjust red-dot sight position 2 MOA per click. As I found when aligning the sight to point of impact, the elevation turns counterclockwise to raise the dot. Turning clockwise moves the red-dot sight to the right on the windage adjuster.

Sighting a dedicated thermal optic can be a pain. I've lost count of the times I've taped a HotHands hand warmer to a target to get a rifle dialed in. That exercise is a thing of the past with the Steiner CQT. Sight in the red-dot sight in daylight, then twist the knob to the thermal setting to find the thermal reticle. The thermal reticle can then be adjusted to co-witness with the red-dot sight. It's that simple.

RANGE TIME

To get some trigger time, I mounted the CQT on my favorite SBR, a Bravo Company AR lower/AAC upper in 300 BLK. This rig also wears an AAC SDN-6 suppressor, and a Law Tactical Gen 1 stock folder.

It took me a dozen rounds to zero the optic at 25 yards. This worked fine for sending another 100 rounds downrange as I swapped back and forth among various steel targets. Zero stayed where it was supposed to be without fail, but I was curious about how much recoil this unit could withstand. As previously stated, it is rated for 1,000 Gs, so I mounted it on a lightweight Ruger Hawkeye Hunter chambered in 6.5 PRC. Sighting it at 100 yards, I slowly ran through 20 rounds and let the barrel cool. Another slow-spaced 20 rounds downrange and I quit for the day.

The next day I repeated the exercise, but removed the brake for the final 20 rounds to increase recoil. I got a slight point-of-impact shift from removing the brake, but made note of where the rounds impacted. On day three, I put the final 20 rounds downrange without the brake, and shots landed where they had the previous day. No adjustments were necessary to keep the red-dot sight and POI aligned. I had also previously aligned the thermal to the red-dot, and it stayed put. Just to be sure, I taped a HotHands to a steel target at 100 yards and proceeded to destroy it with a half dozen shots as the last light of day faded.

PARTING SHOTS

Steiner just released CQT units on the market, according to Marketing Manager Dennis Phillips. "The full retail price is \$9,999, and it is available now," Phillips said. "The current product plan has a consumer version on tap for 2021 that will be much more affordable. The current model is ruggedized for use by military and law enforcement."

This optic holds lots of promise for the good guys who earn their pay shooting bad guys. It's also top-shelf equipment for serious nighttime varmint hunters. Check one out, you'll be impressed. For more information, visit steiner-optics.com.



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ONE IN THE HAND

**A PRO'S TAKE ON WHETHER
FLIR'S NEW SCION PTM
THERMAL MONOCULAR IS
READY FOR DUTY?**

[BY ROBERT JORDAN]

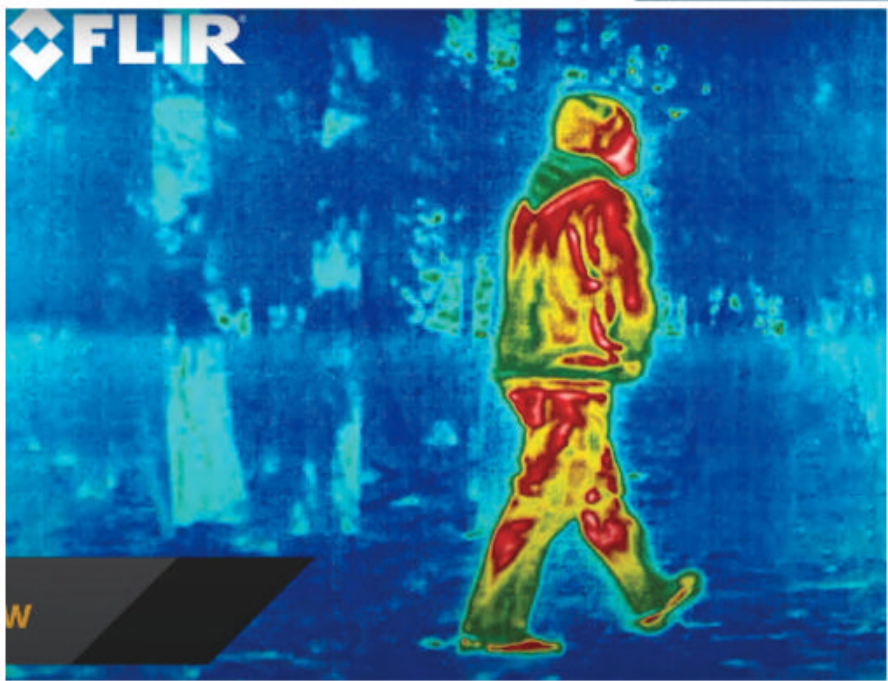


I have been fortunate to have worked for Uncle Sam and I have played with some pretty cool gadgets on the job. The handheld thermal camera might not be the sexiest because it isn't mounted on your rifle or on your helmet, but it is arguably the most useful piece of equipment you will come across for both hunting and law enforcement. Not only can you use it both night and day, but it actually makes your prey glow and stand out in a way that night vision simply does not.

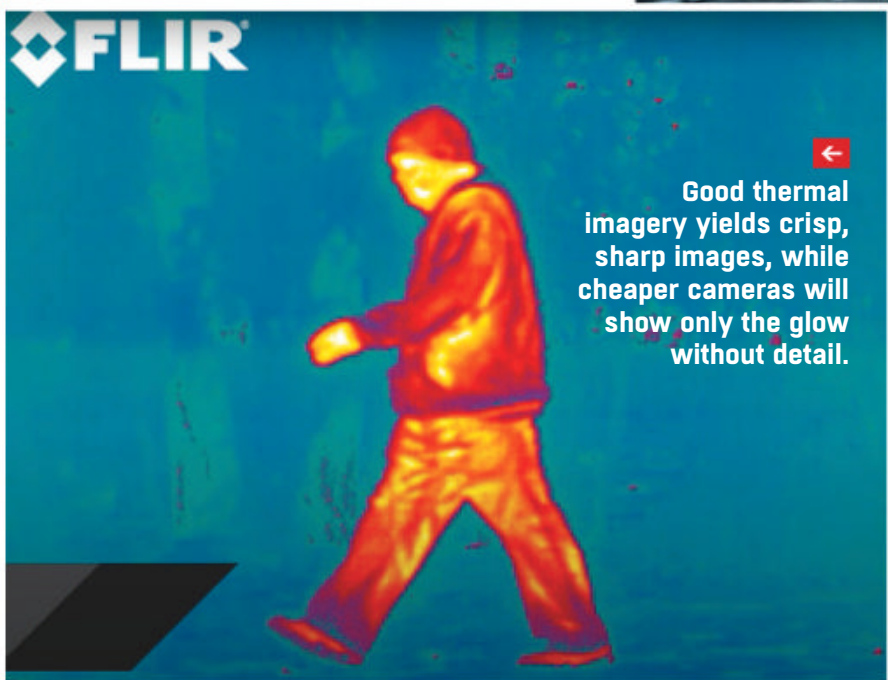
I was first introduced to stationary thermal units in the U.S. Border Patrol back in the 1990s. We had a unit mounted on the roof of the Imperial Beach Station and we could see all the way down to the plateau centered in our five miles of border. It was a fantastic tool, but limited due to non-mobility. Later, when I worked in Arizona, the National Guard would bring out heavy, tripod-mounted, mobile thermal units that could easily zoom miles away with fantastic clarity. But even these "mobile units" required one guy to carry the massive tripod, one to carry the camera and a third to carry the batteries.

Fast forward to this year, when I was invited to check out FLIR's Scion Professional Thermal Monocular (PTM) at SHOT Show 2020 in Las Vegas. I met with FLIR Marketing Manager Shannon Jidas. My initial impression was that it looked like the FLIR Scout, which was introduced in 2012 and has been improved over the years. But while the Scion does resemble the Scout, the internals are completely different.





With the FLIR Scion the user can choose the color palette that gives him or her the most lucid details.



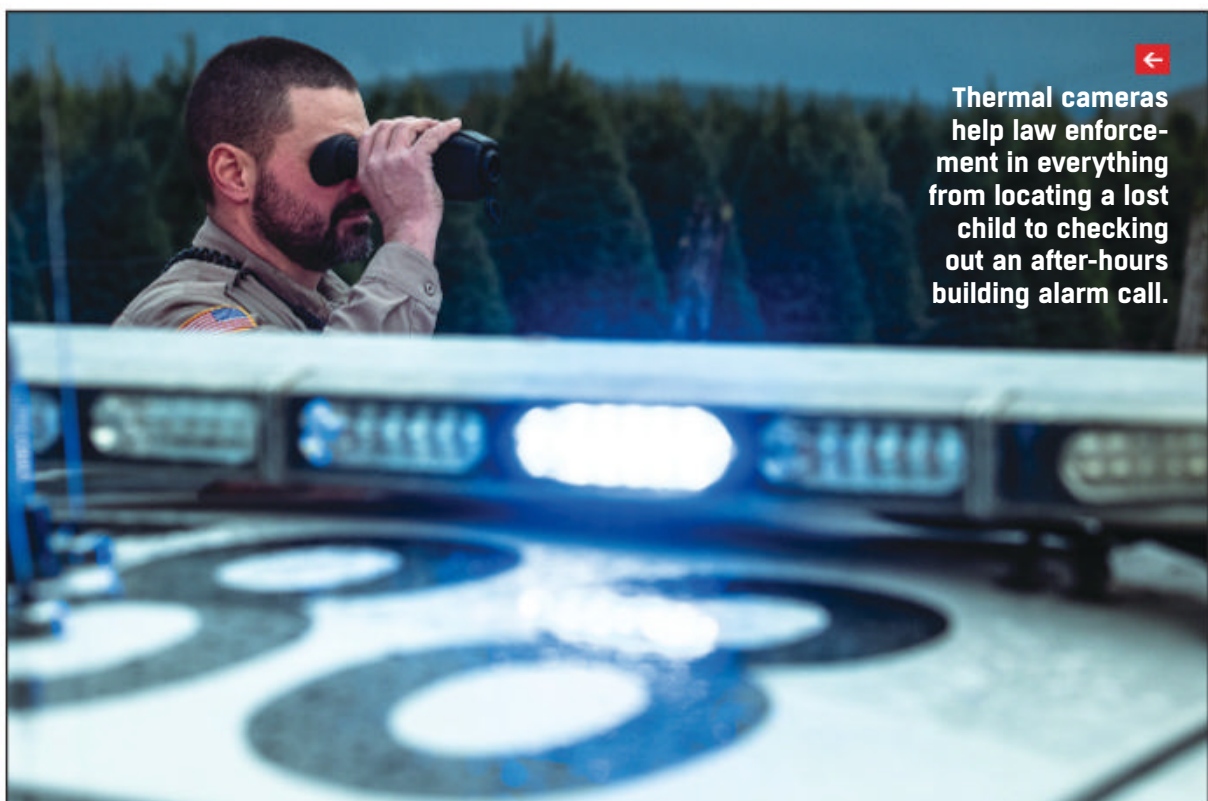
Good thermal imagery yields crisp, sharp images, while cheaper cameras will show only the glow without detail.



PTM DETAILS

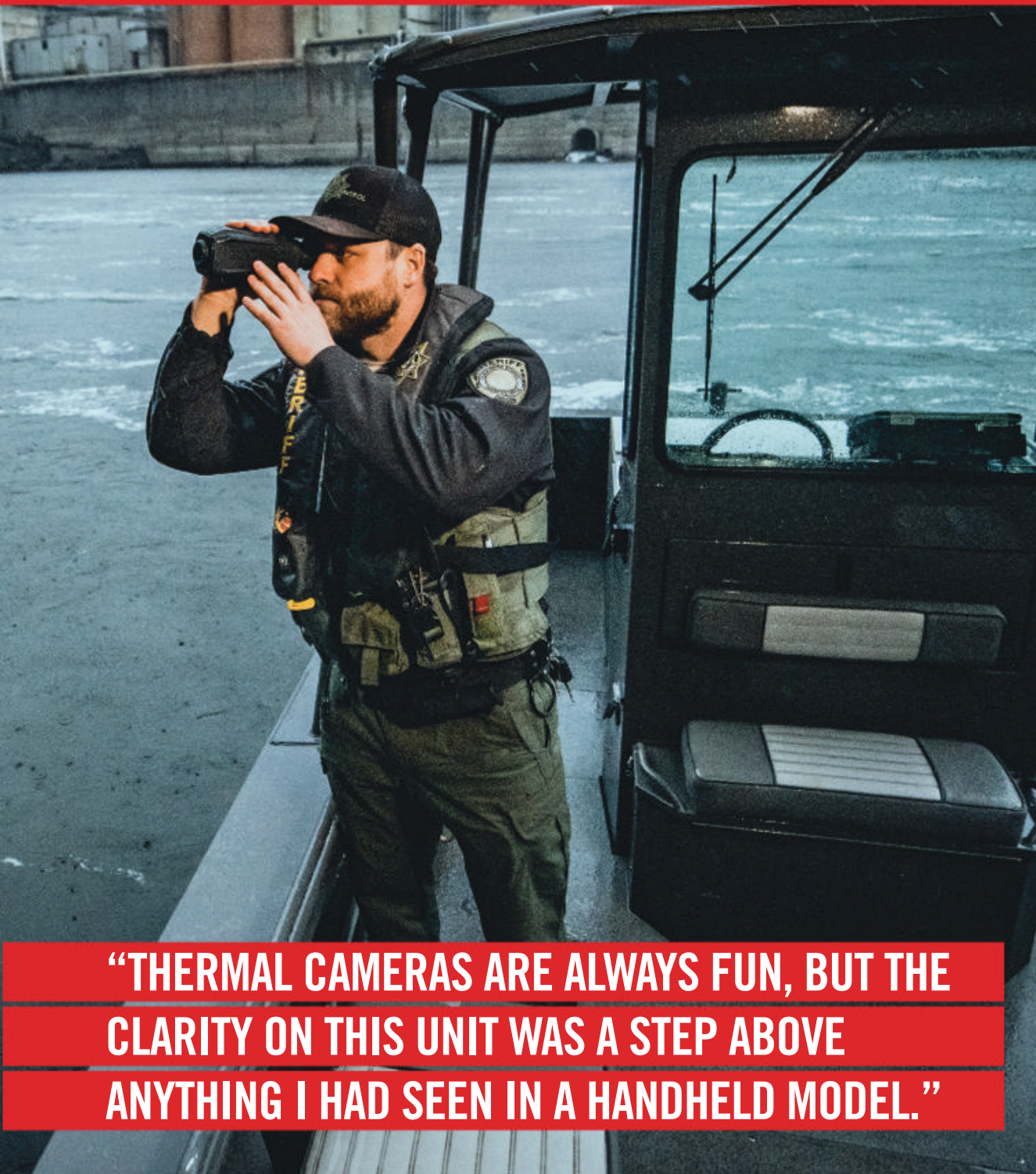
The core features of the PTM set it apart: a cleaner, crisper picture than the Scout, a 60-hertz refresh rate (no noticeable lag when panning), and 2 gigabytes of internal storage and a microSD card slot to record up to 128 GB of geotagged video or still images for later playback. Additional features include up to 8X zoom, picture-in-picture zoom and global positioning system (GPS) functionality, with both Bluetooth and Wi-Fi capabilities to allow simple file transfer between devices.

The final version of the Scion PTM wasn't in production yet, but Shannon had a prototype for me to try out at the show. It was jaw-dropping. I spotted a completely hidden nicotine patch under a guy's shirt, pasted on his shoulder.



Thermal cameras help law enforcement in everything from locating a lost child to checking out an after-hours building alarm call.





“THERMAL CAMERAS ARE ALWAYS FUN, BUT THE CLARITY ON THIS UNIT WAS A STEP ABOVE ANYTHING I HAD SEEN IN A HANDHELD MODEL.”

Invisible to the naked eye, it showed up crisp and clean on the PTM. Thermal cameras are always fun, but the clarity on this unit was a step above anything I had seen in a handheld model.

Shannon explained that the Scion PTM was designed for law enforcement and public safety. It is compatible with FLIR's TruWitness network system. TruWitness is a wearable camera platform for city-level security and public safety operations. Basically, all public safety officers wear a body cam, and the live footage is sent back to a central hub where the video, audio and location data can be used to better coordinate resources. For example, a car chase ends in a crash into another vehicle followed by a foot pursuit into a quiet

suburban area at 2 A.M. TruWitness data has GPS, so the command center can dispatch EMS to the crash, which was witnessed by a pursuing marked unit. Meanwhile camera footage from all responding units can be watched to see if anyone spots the fleeing suspect. The thermal heat signature is picked up by a Scion PTM deployed in a helicopter. The suspect is hiding behind trash cans in a backyard and appears to have a handgun and points it at the helicopter, so it breaks away. The officer in the helicopter might not know the address of the house, but transmitted GPS coordinates from the footage can quickly pinpoint the suspect's location and send it to officers on the ground. They can set up a perimeter, evacuate

families who might be in danger and keep the individual from fleeing, while a Special Response Team (SRT) comes in to address the problem.

INSTANT PHOTO BOLO

That all sounds pretty awesome, but what if the city isn't set up with TruWitness? No problem. How about the Scion PTM takes a thermal photo of the suspect in the backyard and sends a picture to the smartphone of every cop on the ground? Ever been in a pursuit, and the bad guy tosses a baggy out the window? The pursuit might go on for another 10 miles. Wouldn't it be nice to look at the recorded footage and radio to other officers where exactly they should look for evidence he ditched? What about aerial units trying to vector in search and rescue to a mountain climber stuck on a cliff with a broken leg in the dark and going hypothermic? The uses for this tool are nearly endless. Not the least of these features is the recording of all events for future courtroom use.

A few months later Shannon sent me out a demo model of the Scion PTM to try out. My first impression was, "This thing takes a lot of batteries." It takes six CR-123A batteries, to be exact. Fortunately, I buy them in bulk because I run a lot of tactical flashlights, and most of them require this lithium battery. I also noticed it did not come with a manual. The buttons are pretty intuitive, but I still wanted to look through the manual to make sure I wasn't missing something. I shot off an email and Shannon explained the manual was downloaded into the Scion PTM. You simply plug it into your computer with a USB-C cable and it pops up. Plus, while the unit's software can be updated, the manual can too. No more losing the directions.

The physical Scion PTM comes in black with a rubberized coating and rubber eyepiece to block out peripheral light and prevent the glow from lighting up your face. The battery compartment is rated IP67 watertight, but can be quickly accessed without tools. A metal loop folds down and turns 90 degrees, and the compartment pops open. Inside, there is a battery tray that holds the six



3-volt lithium batteries. Even the battery tray is cushioned to hold up to heavy use. The bottom of the PTM can take a 1/4x20 threaded screw so it is mountable on any standard camera tripod—a useful feature for stationary viewing. The monocular has a large focusing ring that turns about 270 degrees so you can adjust focus for your eye. The small, 14mm lens has a flip-down rubber cap to keep it from getting scratched when not in use. A small light on top with the buttons shows whether the Scion PTM is powered on or off.

TEST RESULTS

OK, so how does it work? I compared it to four other thermal units that I could get my hands on, and the Scion PTM blew them all away. I set up the Pepsi Challenge with a lot of buddies and they all picked the Scion PTM, hands down. Clarity was key. Plus you can pick between six different “palettes” to see the heat. Forget white hot vs. black hot. The Scion PTM has a color screen to see in pinks, purples, greens and browns.



← Unlike night vision, thermal cameras work day and night.

“AWESOMENESS SUCKS ENERGY. IDEALLY, THOSE SIX BATTERIES WILL GIVE YOU ABOUT 4.5 HOURS, BUT EXPECT A LITTLE LESS.”

We also liked the 8X power digital zoom, but at that power, the picture is considerably more pixelated and less sharp. The “picture-in-picture” option allows a small, zoomed area to constantly be visible. I quickly grew to love

it. You have your wide, peripheral view, and then, without touching a button, you have your zoomed-in view of anything that catches your eye. Picture-in-picture can be turned on and off, based on personal preference.

FINAL CONSIDERATIONS

Now let me cover the pressing questions. First, how is battery life? Awesomeness sucks energy. Ideally, those six batteries will give you about 4.5 hours, but expect a little less. If necessary, it can run on two or four batteries if that is all you have. Maybe FLIR will come out with a rechargeable battery pack? Second, can you use it as a rifle sight? Nope. FLIR has the ThermoSight Pro series of riflescopes with the same Boson core as the Scion PTM. Third, is there a non-law enforcement version without all of the TruWitness bells and whistles so I can get it cheaper? Yep! It is called the Scion OTM (Outdoor Thermal Monocular) and it runs almost a thousand dollars cheaper. The Scion PTM starts at \$3,295 and the OTM starts at \$2,495. Bigger lenses and higher-definition screens drive the price up. I tested the base model, and I was still bowled over.

For more info, visit flir.com.





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Pulsar's new Thermion XG50 was among several new products showcased at the Athlon Outdoors Rendezvous in

Driggs, Idaho, last September. Mounted on a semi-auto rifle, the Thermion XG50 didn't look much different than any of the gaggle of day scopes up and down the firing line.

Tagged as the PR maven for Pulsar, as well as Sightmark, its sister company, former Marine Kevin Reese shared a rundown of the new optic. "The Thermion XG50 has a 3-24X magnification range with a 42mm objective lens," Reese said. "It features a 640-core sensor with a 12-micron pixel pitch. We're the only one in the industry to offer a 640/12 thermal. The sensor is a BAE, while our proprietary 640/12 core makes it the only thermal in the industry capable of onboard video. It has an exter-

nal lithium battery and also an internal lithium battery that will give it an extra hour and a half of runtime. We have a USB connector under the other turret that lets you hook up and download video. You can also use our Stream Vision app to stream data wirelessly to your smartphone or tablet. And you can connect it wirelessly to your smartphone or tablet so you can view what's in the viewfinder simultaneously."

Providing some pretty heady, state-of-the-art design and the latest in advanced technological innovations, the Pulsar Thermion XG50 delivers some premium thermal imaging, but with a difference. It's built using a traditional-style, aircraft-grade 30mm tube, so it's got a more familiar profile, and it mounts like your traditional day scope. Thermion thermal riflescopes are available with its flagship 640x480 microbolometer sensor resolution with a 17-micron pixel size. This is a cutting-edge thermal-imaging riflescope for professional hunters who value tradition and seek technological superiority.

FEEL THE PULSAR

HANDS-ON WITH THE SUPER-UPGRADED
THERMION XG50 THERMAL HUNTING OPTIC
[BY JAY LANGSTON • ALEX LANDEEN PHOTOS]



The Pulsar XG50 offers 3-12x digital magnification to crank up the detail when you've centered a pig or wily predator in your crosshairs.



“...THE PULSAR THERMION XG50 DELIVERS SOME PREMIUM THERMAL IMAGING, BUT WITH A DIFFERENCE.”



FIRST IMPRESSIONS

While I didn't exactly take a hammer to the Thermion XG50 during use, it feels pretty bombproof in its construction. It's got an aluminum tube and offers a removable rubber eye cup to reduce reflections.

The Thermion's high-quality germanium optics coupled with its advanced thermal-imaging sensor ensure an unprecedented detection range of up to 2,400 yards in complete darkness, according to the manufacturer's claims.

The XG50 operates on newly developed electronics that allow the unit to start almost instantly, and certainly faster than the other thermal optics I have had the opportunity to use. Quick start-up saves both battery power and increases runtime. The optic can be carried in the off mode and rapidly activated when a shot opportunity arises.





It's all about the algorithms. The Thermion's Image Boost Technology is comprised of software algorithms designed to increase imaging clarity and overall image detail. This yields a sharper, more detailed field of view while enhancing objects. That makes it easier to clearly identify what's in the crosshairs.

The Thermion is pretty tough, too. It is rated up to 6,000 joules, which means it can handle a .375 H&H Magnum or a 12 gauge without shaking its electronic innards to pieces.

The XG50 isn't the first Pulsar in its lineup that I've had used to line up a pig or 'yote in its crosshairs. The XG50—like its predecessor the XP50—offers 2X optical magnification. The difference between the two units is that the XP50 has a digital magnification range between 1X and 8X, while the XG50 offers 3-12X. When you double the top end of the digital range at the 2X setting, it takes it to the new power max of 24X. When increasing the magnification on the XG50, the choices are limited to 3X, 6X, 12X and 24X.

NEXT-GEN CREDITS

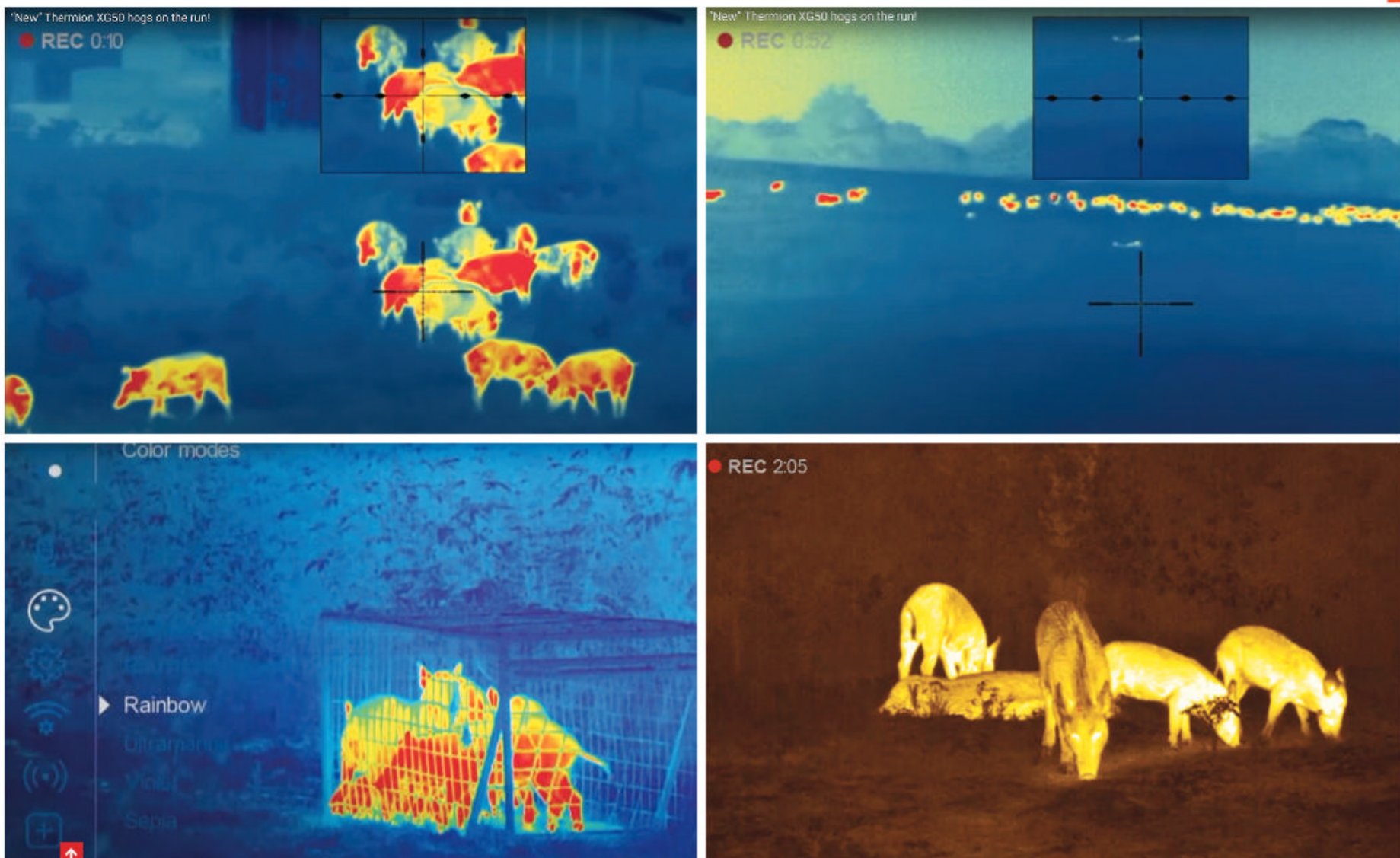
A bit of history on Pulsar's thermal scopes notes that the XP50 was an upgrade and physically redesigned version of the Trail lineup of riflescopes. Pulsar kept the 640x480 sensor resolution from the Trail, and also included rechargeable batteries, one-shot zero, picture-in-picture and on-board recording. The XP50 transitioned to its traditional day scope profile, which is retained in the XG50.

Another super-cool feature on the XG50 is Bluetooth sync, which allows it to display its viewing screen on a smartphone. With an earlier Trail model, the Bluetooth sync was so precise that I was able to hold a rifle steady with my eyes closed while Athlon's Editorial Director, Nino Bosaz, gave me voice command adjustments while he stood behind me and watched the video output on a phone. Once he had me lined up with the target, he gave the "fire" command, and we were rewarded with a resounding clang at 100 yards. After I recovered

from recoil, he repeated the necessary hold adjustments until the target was reacquired. Shot after shot, we teamed up to hammer steel.

The Pulsar Trail XG50's Stream Vision app connects the scope to a smart device. To go along with this, it has an integrated high-definition video and sound recorder. While hog hunting at night, it's possible for more people than the shooter to view the action in real time, sharing the thrill. Some of the accompanying screen grabs from YouTuber "a.amantine" prove the point. His videos are definitely worth checking out. Video recording allows for later playback. The Wi-Fi sync also makes transferring recorded files, adjusting settings and upgrading firmware a snap.

The Thermion's other new features compared to the older Trail include a new battery style that loads in the top turret, and its compatibility with 30mm scope rings. The Thermion retains all the Trail's firmware features but adds crisper color reticles in green, black, red or white.



Images Courtesy YouTuber A.Amarante

The rugged Thermion XG50 from Pulsar is rated to handle stout recoil up to a .375 H&H Magnum, works in a wide range of temperatures from -13 to 122 degrees and is also waterproof, able to withstand submersion in one meter of water for 30 minutes.

CUSTOMIZE YOUR THERMION

The Thermion's memory allows saving three individual firearm and ammunition zeroing setups at five different distances, using different reticles. That's extremely useful if you are shooting a cartridge like the 300 AAC Blackout. One zero setup can be specified for subsonic loads, and another for hypersonic ammo. This can make a big difference, since point of impact will probably be more than 12 inches apart between subs and supers at 100 yards. The farther you get, the more pronounced the difference.

Another first is that the Thermion was the first Pulsar with reticles that can be used to scale, similar to mil-dots in a day scope. Pick one of the ranging reticles, use it in 1x mode and you'll find that it has corresponding MOA values that can be matched up to deer-sized or coyote-sized targets.

The PIP mode (picture-in-picture) can help fine-tune aiming by providing a magnified image of the center of the

crosshairs in the top tenth of the display area. You can simultaneously view the PIP and normal field of view.

Integrated video and still-image recording in MPEG-4 and .jpg formats allows the Thermion XG50 to share thermal action easily. The onboard 16GB memory stores thousands of photos or many hours of video, and it handles recoil without a hiccup.

READY TO ROCK

The Thermion also is IPX7 waterproof-rated for protection from heavy rainfall, snow and other precipitation. And it is designed to run flawlessly, even after submersion in up to 1 meter of water for up to 30 minutes. Not only can it handle water, it's rated to work in temperatures from -13 to 122 degrees Fahrenheit. Its frost-resistant AMOLED display will keep working in a wide range of temperatures.

Pulsar listened to customers when it upgraded to the XG50. They took consumer feedback on their previous

thermal optics, incorporating tweaks and upgrades to make it more user-friendly. The easy-to-read status bar at the bottom of the display shows intuitive icons and alpha-numeric feedback so you can know the status of the unit instantly while keeping the crosshairs on game.

Another consumer-driven tweak to the XG50 is its display-off mode. In a night hunting situation, the viewing reticle produced a light signature that can spook game. The press of a button powers off the display without interrupting other operating functions, such as the sync to other devices. That means that once game is spotted, the unit's display can be powered back up fast.

The Thermion XG50's warranty lasts three years after purchase, and Pulsar has earned a great reputation for being responsive to customers who need help or advice. And, with a price tag well north of \$5K, you get what you pay for in the end. Previous versions have been in high demand, so we expect this unit to sell well. For more, visit pulsarnv.com.



CA5five6

The NEW CA5five6 is a serious top-tier contender in the field, with a Christensen Arms carbon fiber wrapped barrel and a new carbon-aluminum hybrid handguard.

STARTING AT	ACCURACY GUARANTEE	RETAIL PRICE
6.3 LBS	SUB-MOA	\$1,495

CHRISTENSENARMS.COM/CA5FIVE6







DISCREET 9MM STINGER

**HAVE A SILENT
BLAST WITH
CZ-USA'S LATEST
SCORPION EVO 3 S2
MICRO PISTOL**

[BY ANDY MASSIMILIAN • DENNY GIACOBE PHOTOS]



The EVO 3 S2 Micro is CZ's third and most featured rendition of the Scorpion EVO and is the civilian version of a specially equipped EVO submachine gun made for a narcotics interdiction agency that wanted something short, potent and suppressed. To make that weapon, CZ shortened the barrel on the EVO S1 from 7.75 inches to 4.12 inches, switched to a shorter forend made by HB Industries and supplied a CZ S2 Ti reflex suppressor.

The S2 Ti reflex is 9.2 inches long, but extends only 5.8 inches beyond the muzzle because its 2-inch reflex chamber wraps around the barrel to provide the needed volume to cool and slow the combustion gases without adding length. The civilian version tested here is patterned after the narc cop sub-gun, but is a pistol with an arm brace rather than a collapsible stock and is equipped with an inert No Osprey suppressor made by SilencerCo. The No Osprey resembles SilencerCo's distinctive-looking Osprey 9.

GUN DETAILS

The S2 weighs 5.5 pounds and is 16.4 inches/23.4 inches long with the brace collapsed/extended. Removing the arm brace trims the weight to about 4 pounds. It's constructed with two polymer shells joined together clamshell style with six hex-head screws that contain the serialized and FFL-controlled steel receiver. The swing-down trigger assembly is connected to the assembled shell by a pin up front and a ledge at the rear. Though much of this pistol is made of polymer—including the trigger face, mag release and safety levers—the internal components of the firing mechanism are steel, and the unit is hammer-fired.



DISCREET 9MM STINGER

The S2 shares the appealing and not-so-appealing features of the Scorpion EVO series. On the plus side, the S2 has ambidextrous safety levers and mag release, a reversible charging handle, adjustable sights, a grip that can be slid forward and rearward to adjust trigger reach, and simple, tool-less takedown. The bolt locks open after the last round is fired by action of the bolt catch. It is mounted on the left side and is readily accessible to your thumb when grasping the weapon by the mag well. Most significant among the positive attributes, however, is a design that lends itself to easy replacement of parts that are made by several companies, making the Scorpion EVO among the more customizable pistol-carbine platforms available.

The S2's features that could use improvement are the shape of the safety levers (which abrade the firing hand's trigger finger), a cocking handle that is too small and causes you to rap your knuckles against the receiver's top rail and a long, gritty trigger pull that measures 9 pounds, 10 ounces on a Lyman gauge. Fortunately, these shortcomings can be overcome with a cornucopia of aftermarket parts from HB Industries, Nelson Precision, Shooters Element, Yeti Wurks and others. CZ Custom also sells a trigger pack that replaces all trigger-related parts—not just the return spring—but for a hefty \$221.

The S2 is blowback-operated and comes with two 20-round, translucent polymer magazines. Charging is done with a small, non-reciprocating handle mounted on the top forward portion of the forend, which operates similarly to the cocking piece on the HK MP5. When retracted, this handle can be pivoted upward to engage a notch and lock the action open. The S2 also uses a safety that arrests the forward movement of the firing pin until the trigger is engaged, a feature that AR-type 9mm guns lack.

The steel and aluminum sights consist of a protected aperture rear and a protected front post. Elevation is adjusted at the front using a supplied tool, and windage at the rear by turning a knob secured with detents. The rear



→ Removing a single push pin allows the trigger group to be removed and then the bolt carrier group. It's all that is needed for routine cleaning.

“THE S2 SHARES THE APPEALING AND NOT-SO-APPEALING FEATURES OF THE SCORPION EVO SERIES.”



← CZ's S2 suppressor enhances the aesthetics of the S2 Micro, more so than the No Osprey fake can. Other suppressors fit in the hand-guard without any issues.

→ The safety lever and charging handle are two items that are really improved by installing aftermarket parts.



sight has four different-size apertures, but only the largest two are practical to use when sighting the S2 at arm's length. The sight radius of 9.25 inches puts the S2 in the same range as a Model 29 revolver with a 6-inch barrel, but with the added sighting benefit of an aperture.

The forend is M-LOK capable and affords a comfortable hold, but if you grip the forend instead of the magazine well, only one side has enough space for mounting a light or laser. A hand stop helps prevent you from sliding your hand forward in front of the muzzle.

CZ'S S2 REFLEX CAN

Mounting the S2 Reflex suppressor is easy, but you will need a tool from HB Industries to remove the castle nut that secures the faux suppressor to the barrel. CZ makes the S2 Reflex suppressor in stainless steel or titanium, each with a 1/2x28 TPI mount. This can was made for the S2, but it will fit EVO 3 pistols if you change the handguard and barrel, and 9mm ARs with standard-diameter barrels. The Reflex is 1.5 inches in diameter and is a tubeless design that uses two blast baffles followed by seven main baffles, which surprisingly are closely patterned after those in the original Maxim silencer. The titanium (Ti Reflex) version weighs

9.6 ounces, while the stainless steel weighs 15.4. Mounting the Reflex can extends the length of the entire weapon by 4.2 inches compared to the stock S2 version with the No Osprey fake can.

RUNNING THE SCORPION

Pistols with arm braces don't lend themselves to an easily assumed firing platform that aligns your sighting eye with the gun sights, so they require experimentation. However, I tested three shooting methods, none of which uses the brace as a stock.

SPEC BOX

CZ SCORPION 3 S2 MICRO

CALIBER:	9mm
BARREL:	4.12 inches
OVERALL LENGTH:	16.35 inches, brace collapsed; 23.35 inches, brace extended
WEIGHT:	5.5 pounds
HEIGHT:	9.4 inches
SIGHTS:	Windage-adjustable rear aperture, elevation-adjustable protected post front
STOCKS:	Polymer
ACTION:	Semi-auto
CAPACITY:	20 +1
MSRP:	\$1,211



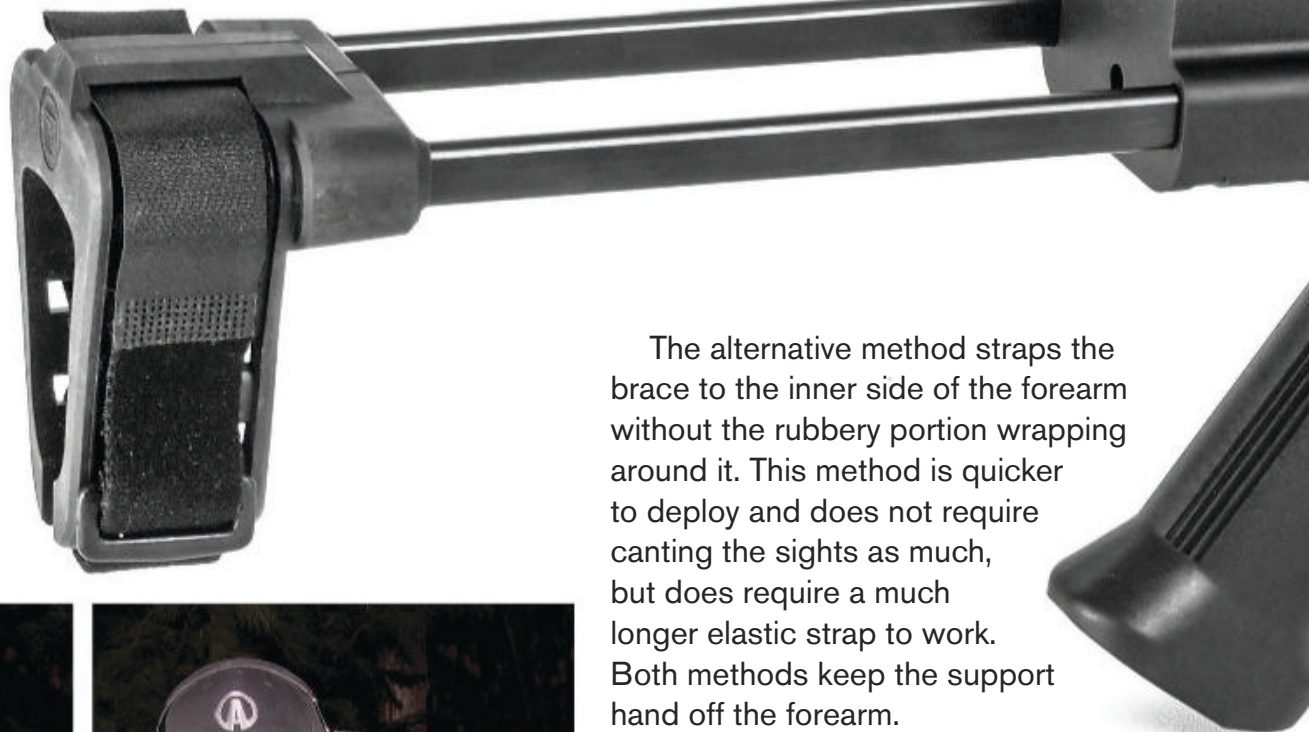


DISCREET 9MM STINGER

The first and most intuitive technique uses the back of the arm brace as a cheekrest. The brace sits about 1.5 inches forward of your shoulder, but contacts your cheek and lightly contacts your firing arm to dampen wobble. Your support hand grasps the forend or the magazine well. This position is rapid to assume and comes closest to naturally aligning your dominant eye with the sights.

The other two methods strap the arm brace to your forearm. The first requires you to take a bladed stance to the target and use the brace as designed, with both rubber legs wrapping the forearm secured with the elastic strap. You'll need to cant the weapon inward to align your dominant eye with the sights, and grasp the pistol grip with your support hand.

“ADDING THE TI REFLEX SUPPRESSOR DID NOT ALTER THE PISTOL’S FUNCTION OR INCREASE BACKPRESSURE NOTICEABLY.”



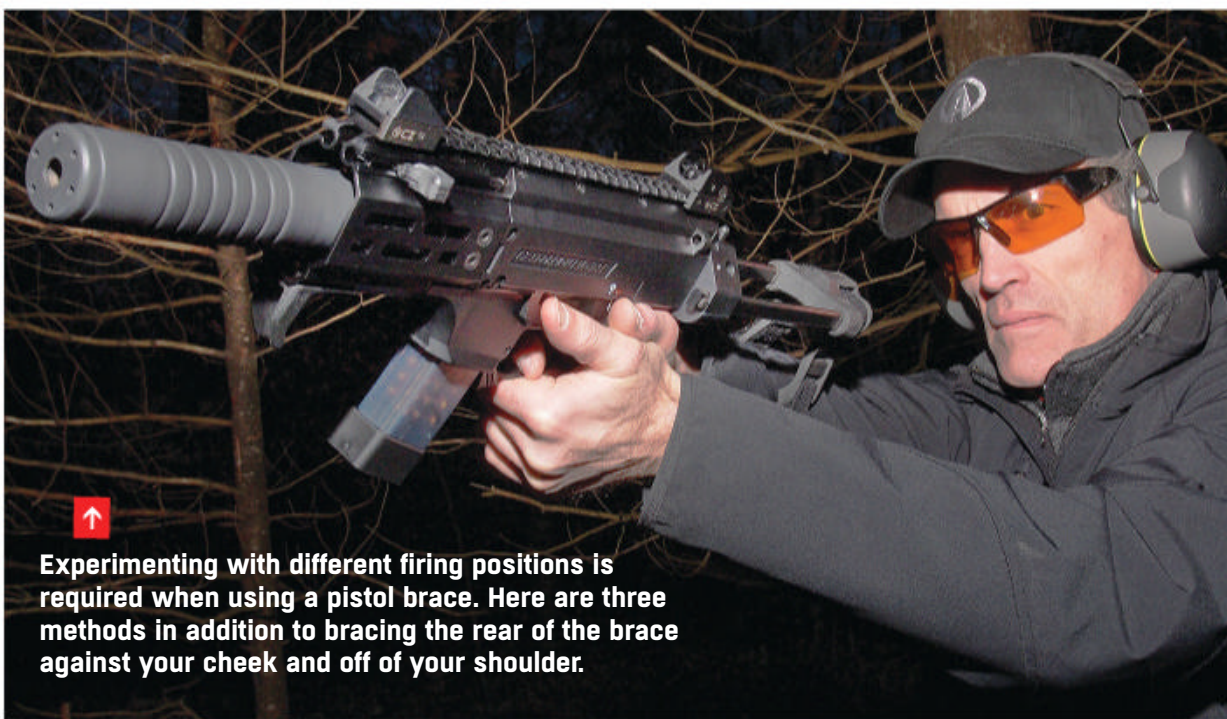
The alternative method straps the brace to the inner side of the forearm without the rubbery portion wrapping around it. This method is quicker to deploy and does not require canting the sights as much, but does require a much longer elastic strap to work. Both methods keep the support hand off the forearm.

Of course, the arm brace can be placed in the closed position and ignored by holding the weapon close to your face, with the support hand on the forend.

The S2's ergonomics are much improved after installing the safety and cocking handle from HB Industries, but the mag release levers and left-side bolt catch work well as is. Southpaws will especially appreciate these controls being readily activated with the left hand's trigger finger. The translucent magazines insert easily and lock firmly into the magazine well with its chamfered edges. They are more durable than they first appear, and survived several hard knocks onto pavement when loaded. This pistol has eyelets at the rear of the grip frame on both sides to attach a sling.

Reliability was good, with two failures to feed flat-nose, 147-grain FMJ rounds in 200 rounds of testing. The Scorpion can use steel-cased and +P ammo, but aluminum-cased rounds are not recommended because of the gun's blowback design.

Adding the Ti Reflex suppressor (which I used for testing) did not alter the pistol's function or increase



Experimenting with different firing positions is required when using a pistol brace. Here are three methods in addition to bracing the rear of the brace against your cheek and off of your shoulder.






backpressure noticeably. Since CZ does not publish sound reduction measurements, I tested the EVO S2 with both the S2 Reflex and the original Advanced Armament (AAC) Ti-Rant 9, which AAC rated as reducing sound by 35 to 38 decibels (dB). Though the CZ suppressor has much more internal volume than the Ti-Rant, it was less

capable at sound reduction by an average of 3.9 dB. However, the Ti-Rant is not a reflex design, and extends the length of the weapon by about 2.2 inches compared to the EVO equipped with the Ti Reflex.

FINAL NOTES

In its ultimate civilian configuration, the EVO S2 is transformed into a short-barreled rifle with a shoulder stock, suppressor, a few aftermarket parts to improve ergonomics and 30-round magazines. That configuration, however, is an expensive proposition that carries \$400 in NFA tax stamps alone, so it would be mighty welcome if CZ sold a version of the EVO S2 without the arm brace and faux suppressor, which could then drop the price tag by close to \$200.

For more information on the S2 Micro, visit cz-usa.com. 

.308 WINCHESTER 152 Gr. Dual Performance™

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Large temporary cavity that exceeds that of conventional bullets



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NOVUS ARRIVAL

ENFIELD RIFLE CO.
DIVES INTO THE
SUPPRESSOR GAME
WITH A BIG AND
MODULAR SPLASH

[BY DAVID KENIK]

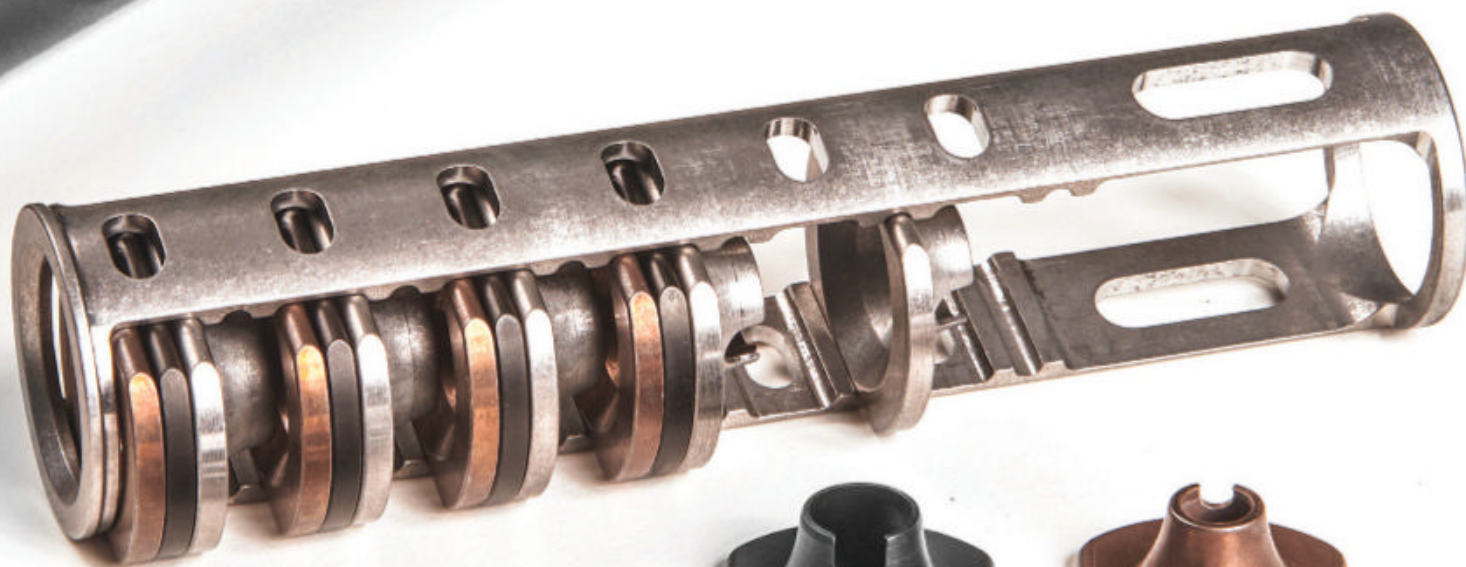





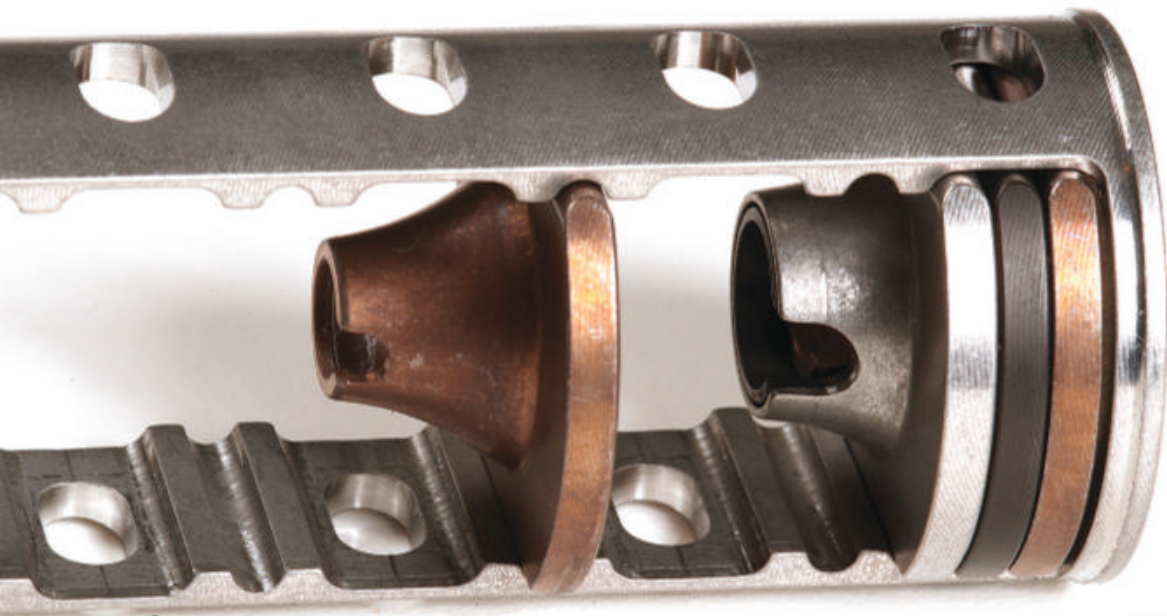
With its new Novus suppressor, Enfield Rifle Company has solved a serious flaw with the design concept of the currently marketed multi-caliber suppressors. Typically, a multi-caliber suppressor has baffles sized for the largest compatible caliber, and you can shoot any bullet that size or smaller.

The only part that is changed is the front cap and possibly the mount, depending on the thread size of the firearm. Yes, it's doable, but the baffles are larger than required for the smaller calibers, which reduces the suppressor's effectiveness.

With that design concept, a multi-caliber suppressor is fully effective only with its largest caliber. When the caliber is reduced, the suppressor loses effectiveness because, while the front cap is reduced for the smaller calibers, the internal baffles are sized for the largest caliber. While it's in the large baffles, gas easily escapes around the smaller bullet. The increase in escaping gas results in a reduction of the sound suppression capability. It boils down to this: A 5.56 suppressor shooting 5.56 ammunition will be quieter than 5.56 shot out of a .30-caliber suppressor that is converted to 5.56 with just the use of a smaller front cap. This, of course, assumes suppressors of similar size.



 The Novus suppressor includes three sizes of baffles for different calibers. The appropriate set is then installed in the Novus core.



“ENFIELD RIFLE COMPANY’S SOLUTION IS TO INCLUDE THREE SETS OF DIFFERENT-SIZED BAFFLES WITH ITS NOVUS SUPPRESSOR.”



Allowing all three sets of baffles to be installed simultaneously in the core means that the Novus is one can instead of three.

A NEW DEAL

Enfield Rifle Company’s solution is to include three sets of different-sized baffles with its Novus Suppressor. They dubbed it “the world’s first user-optimized silencer system.” Their webpage boasts: “Utilizing a user-configurable core and baffle system, the Novus allows the shooter to quickly switch among three optimized suppressor “calibers”—.22 for rounds from 22LR to .224 Valkyrie, .30 for rounds up to .300 Win Mag, and .45 for rounds up to .458 SOCOM. This allows you to use one suppressor—with one tax stamp—to mount on almost all of your pistols and rifles.”

The system is not 100 percent perfect, since the Novus doesn’t have a baffle stack sized for every specific caliber between .22 and .458, but it’s darned close to perfection for the majority of situations, and a far sight better than current competing multi-caliber designs that use a single, large baffle stack regardless of caliber.

The Novus Suppressor includes the tube, three baffle sets and its unique,

modular baffle core, which holds the baffles. The baffle sets consist of six baffles in each of the three sizes.

The suppressor ships with all three sets of baffles installed within the baffle core. The core has tracks in which the baffles are housed. There are six tracks for the triple baffle stack and six single tracks. The user simply slides in the appropriate baffle set and stores the remaining baffles in the hard case, which is included with the Novus.

BIG SAVINGS

I have to admit that I was stymied about the reason why the design enabled all three baffles to be installed in the core at the same time. I took it apart several times over a few days to try to figure it out and after finally conceding to myself that I was stumped, I called the manufacturer for the answer. I asked, “Why is the core designed to hold all three sets of baffles when the shooter will only use one set at a time?”

Doug Duggan, one of the principals of Enfield Rifle Company, told me that

the design allows them to ship three sets of baffles without needing multiple tax stamps. He further explained that BATFE considers baffles to be suppressor parts, and by definition, they are themselves suppressors. Since a firearm can be shot with all three set of baffles installed, it is considered just one suppressor. The suppressor’s caliber designation is 5.56, and 5.56 ammunition can be shot with all three baffle sets installed. This is not true, though, for larger calibers, since they won’t fire through the 5.56 baffles.

My response to Doug was a single word: genius. What a great way to legally get around the nonsense that is the NFA! The design, of course, was approved by the BATFE.

The Enfield Rifle Company has no relation to the famous British Lee-Enfield rifle. The founder is an enthusiast for Allied weaponry from World War II, and since there was no registration of “Enfield Rifle” in the United States or in their home state of Georgia, the name was chosen.



THE NEW STANDARD



CZ P-10 F
FDE

In addition to the crisp trigger and engineered ergonomics that have made the P-10 platform a favorite, the full-size frame of the F brings a longer sight radius, longer barrel and longer grip for increased consistency and control.



CZ P-10 F
BLACK



CZ P-10 F
OD GREEN



DIGGING DEEPER

The company started in 2012 as a small, custom builder of AR-15 rifles. One of the owners, Michael Tiziani, a former Army Ranger and mechanical engineer, envisioned the concept of the Novus in 2018. It was brought to market in 2020. The Enfield Rifle Company still builds ARs, but their primary thrust is now the Novus Suppressor.

The Novus's tube is made from titanium, and the modular baffle core, baffles, front caps and mounts are 17-4 stainless steel. To make identification easy, each baffle set is a different color, as determined by the finishing technique. The small set is just heat treated to create a bronze appearance, the middle-sized set is black with its nitride finish and the largest set is unfinished stainless.

In addition to legally flouting ridiculous NFA laws, user-serviceable baffles offer several advantages. In addition to allowing for caliber changes, they can be easily removed for cleaning, and their position within the core can be rotated as they wear. The baffle nearest the muzzle takes the brunt of the force, and swapping it with a less-worn baffle increases the sound suppression efficiency. Lastly, a damaged baffle can be easily swapped for a new one. By law, unless a new tax stamp is purchased, a manufacturer cannot ship a new baffle, as that would be considered a silencer transfer, but they can exchange a new baffle for a damaged one.

Given the tolerances needed to allow for carbon buildup, the single slots in the core are slightly wider than the baffles themselves, which leads to a slight rattle when the suppressor is new. After 20



PERFORMANCE		
LOAD	VELOCITY	ACCURACY
Berger 140 hybrid	2,759	0.75
Hornady 120 ELD match	2,846	0.75
Hornady 147 ELD match	2,662	0.55

Bullet weight measured in grains, velocity in feet per second by chronograph and accuracy in inches for best five-shot groups at 100 yards.

to 30 or so rounds—depending on the caliber—the carbon builds up and the rattle disappears.

ON THE RANGE

Sound ratings supplied by the company are 132 decibels (dB) for 9mm, 147-grain bullets out of a Glock 17, 138 dB for 55-grain 5.56 out of a 16-inch barrel and 128 dB for 300 BLK shooting 200-grain subsonic from a 16-inch barrel. Also, 125-grain and 147-grain 300 BLK supersonic clocked in at 138 dB. The Novus is 6.75 inches long and 1.5 inches wide. Weight with the one set of baffles is 14.2 ounces.

Note that dB ratings are not easily comparable among suppressor manufacturers, as there are lots of variables that cannot be accounted for, such as differences in physical location, terrain, elevation, humidity, temperature and numerous other atmospheric conditions.

The Novus can be used as direct-thread or as a quick-detach (QD) unit. It is also compatible with several mounts, including the Dead Air Silencers KeyMo, Griffin Armament Plan-A, Q Plan-B, SilencerCo ASR, Torrent Suppressors



The Novus suppressor consists of the body, the core, three sets of baffles, the front cap and the mount.



QD and Yankee Hill Machine Co. Omega. Minimum barrel length ratings are 10.5 inches for 5.56, 8 inches for 300 BLK, 16 inches for .308, 18 inches for .300 Win Mag and 10.5 inches for .458 SOCOM.

The intention for my accuracy test was to determine if there was any radical shift in point of impact or increase in group size. Impact shifts should be slight, and mostly consist of a lowering of the group placement due to the extra weight hanging off the front end of the barrel.

My test platform was the Bergara Ridgeback in 6.5 Creedmoor with a 24-inch barrel. Bergara has a reputation for outstanding accuracy, and this was my first opportunity to test it. Bergara's premium stainless steel barrels receive a proprietary honing process, and the Ridgeback's barrel has a medium Palma contour. Their Premier action features a non-rotating gas shield, coned bolt nose and sliding plate extractor. Designed as a two-lug system, it features a separate floating bolt head to ensure contact with the lug abutments in the action. Its cone-shaped bolt nose offers smooth feeding of the cartridge, and a spring-loaded sliding plate extractor located in the front of the lower locking lug.

The one-piece bolt body is stainless steel, with a pad at the rear to accept the threaded-in bolt handle. The Ridgeback includes a TriggerTech trigger and Grayboe fiberglass stock with an adjustable cheekpiece and length-of-pull spacers.


For glass, I used Nightforce's ATACR 7-35x56 F1 scope. The scope's high

magnification is great for long-range shooting. I was pleasantly surprised to find that the eye box was not compromised by the high magnification. The scope's internal adjustments are 100 MOA (29 mrad) elevation and 60 MOA (17 mrad) windage, thanks to its 34mm tube. My version has the Milrad Turrets and the TReMoR3 reticle.

PARTING SHOTS

My first test firing was without the suppressor to get a baseline on accuracy. I shot with 120-, 140- and 147-grain rounds, and the Bergara favored the 147-grain pills from Hornady with 0.55-inch groups. That's outstanding for a production rifle with factory ammo, and it will surely improve with custom loads.

The first groups with the suppressor opened up quite a bit. I was quite concerned until I remembered that the baffles had to seat themselves with carbon buildup. It didn't take long. By the fifth group, the accuracy matched that of the groups shot without the suppressor, with no noticeable shift in point of impact. Do note that if you clean the baffles, you will have to carbon them again so they seat tightly.

The Novus Suppressor is quiet, well-built and truly multi-caliber. The user-changeable baffle system makes the Enfield Rifle Company's Novus Suppressor the only fully modular suppressor on the market, and certainly the only one offering full efficiency with all calibers. For more information, visit enfieldriflecompany.com. 




HOOPS

AFTER

DARK



A close-up, high-contrast photograph of a feral pig's face. The pig's eye is visible in the upper left, looking towards the camera. Its mouth is open, and a large, sharp, white tusk is visible on the right side. The fur is dark and textured. The background is dark and out of focus.

CHOP PORK LIKE A BOSS WITH A STREAMLIGHT-EQUIPPED ATO UHS-6.5 AR PISTOL



Night-vision optics were once the sole purview of military and law enforcement agencies. If your email address did not end in .gov, chances were that you couldn't afford decent night vision. However, revolutionary advances in inexpensive microelectronics have now brought efficient night-vision imagers within reach of the common man.

While the practical applications of night vision for security and surveillance are fairly obvious, the real market is hog hunting. Despite aggressive eradication efforts, the feral pig population in America increased by 20 percent per year between 2006 and 2011. These animals wreak around \$1.5 billion dollars' damage to crops per annum. Thus, pig hunting with night vision has become one of the fastest-growing outdoor pursuits in the country.

Streamlight is one of the world's most prolific producers of weapon lights and tactical illuminators. Its products are military tough and reasonably priced. The new Streamlight TLR-VIR II opens up a whole new front in the ongoing fight to the death with the feral hog. To demonstrate this power, let's look at this technology from a different perspective.

[BY WILL DABBS, MD]



iStock Photo

TYPICAL WAR STORY

Abdul Al-Muktari was an IED maker for the Haqqani network in Afghanistan. Al-Muktari and a fellow muj scraped at the soft earth in the enveloping darkness, secure and unhurried. It was 0230, and he would be back home with his wives before the coalition troops in the nearby outpost began stirring.

Meanwhile, 7,399 miles away, it was a bright, sunny afternoon at Creech Air Force Base in Clark County, Nevada. First Lieutenant Margaret Thumblar nursed her coffee while the General Atomics MQ-9 Reaper-armed drone she controlled circled silently in the black skies above Afghanistan half a world away. She sipped her Starbucks as Abdul Al-Muktari and his compatriot industriously pawed at the dusty Afghan earth.

Taking manual control of the \$17 million dollar remotely piloted airplane, she armed a single AGM-114 Hellfire R9X laser-



iStock Photo

“THE CAPABILITY TO SEE IN THE DARK IS THE SINGLE MOST TRANSFORMATIONAL ADVANCE IN MILITARY TECHNOLOGY IN MY GENERATION.”

guided missile. They called the R9X version of the Hellfire the Ninja Bomb. Designed for engagements where collateral damage was a concern, the R9X actually had no warhead. In place of an explosive, this 100-pound missile deployed six long, steel knives that took human life the old-fashioned way, albeit with a little Information Age panache.

On the other side of the planet, the R9X screamed off the rails as little more than a flicker in the inky Afghan sky. Twenty-three seconds later, the R9X impacted at 995 miles per hour. The following morning, a shoe repairman who lived in the small house nearby cleaned up the mess with a hose.

SPEC BOX

ADVANCED TACTICAL ORDNANCE UHS-6.5

CALIBER:	6.5 Creedmoor
BARREL:	12 inches
OA LENGTH:	34 inches extended/ 31 inches collapsed
WEIGHT:	10.8 pounds with thermal sight, bipod and illuminator
BRACE:	SB Tactical SBA4
SIGHTS:	Streamlight TLR-VIR II
ACTION:	Semi-automatic
FINISH:	Cerakote
CAPACITY:	20+1
MSRP:	\$2,233 (base price)



Paired with a Pulsar thermal scope, the Streamlight TLR-VIR II IR illuminator mounted on the AT0 UHS-6.5 is the most efficient nocturnal pig-killing machine yet contrived by man. This trio will own the night.

THE TECH

The capacity to own the night has for the last several decades been the greatest advantage that U.S. forces have had over their opponents. When I flew helicopters for Uncle Sam, we could pull any mission at midnight that we could do at noon. The capability to see in the dark is the single most transformational advance in military technology in my generation. Our aircraft were equipped with powerful infrared (IR) spotlights that would easily displace the darkness when viewed under night-vision systems. These same lights were invisible to the unaided eye.

Modern night-vision devices detect otherwise invisible spectra like those in the IR range and amplify ambient light to create a visible image under low-light conditions. The resulting monochromatic display is adequate to operate a vehicle or target a weapon. Early versions of this technology cost as much as your hometown. Today, you can buy a decent digital night-vision weapon sight online for a few hundred bucks.

NIGHT CREATURES

Pigs are smart. In terms of raw intellect, they are at least as intelligent as dogs.

This means that they learn and learn very quickly.

A local farmer friend had to plant his soybean fields three times last year. In each case, he would plant his seed, and then pigs would root along the rows after dark eating every last bit. When people started shooting them during the daytime, the pigs just transformed into vampires.

I don't have any idea where they go in the daylight. In the 14 years I've lived on my rural farm, I have seen feral pigs only three times during the day. However, judging by their sign, they seem to be everywhere at night.

Pig hunting is by its nature a social sport. It's way more fun stalking swine with the right gear and a few buddies. However, running high-powered weapons safely after dark brings its own challenges. Now, Streamlight offers the perfect tool to enhance safety, increase accuracy and tip the balance of power against the pigs.



The Streamlight TLR-VIR II adds a whole new layer of capability to your favorite nocturnal hog-hunting gun.



A recessed slide switch selects modes between white light, IR light and IR laser.

“THE TLR-VIR II BRINGS TECHNOLOGY TO BEAR ON THE PORCINE MENACE.”

STREAMLIGHT'S TLR-VIR II

The Streamlight TLR-VIR II weighs a mere 3.82 ounces and runs off of a single CR123A lithium battery. At only 3 inches long, it will easily fit on the railed dust cover of a handgun. The temperature-resistant shock-mounted Borofloat glass rides in a durable, anodized, machined-aluminum chassis. The TLR-VIR II has three functions.

First, this device is a 300-lumen white light. This bright-white visible illuminator will run 1.5 hours on a fresh battery. The unit also features an 850 nanometer, 600 milliwatts per steradian (mW/sr) infrared illuminator. In this mode, the TLR-VIR II will light up the night under night-vision systems yet remain undetectable to eyes both human and porcine. The TLR-VIR II also includes

an 850 nanometer Class 1 eye-safe IR laser designator that will run 12 hours on a battery.

The unit features a three-position recessed selector switch that allows the operator to cycle instantly between functions without changing the firing grip. The laser is easily adjustable for both windage and elevation. The entire device is waterproof to 1 meter for 30 minutes. As expected, the TLR-VIR II is built to Streamlight's typical rarefied standard of durability. One-handed mounting keeps your hands from sweeping the muzzle.

THE PORK CHOPPER

Advanced Tactical Ordnance specializes in high-end precision bolt-action rifles that will reliably make a headshot a kilometer distant. Using this same compulsion for accuracy, the company has now produced the ideal counter-pig gun. This compact brace-equipped handgun runs 6.5 Creedmoor through a 12-inch pistol-length heavy target barrel.

The end product is maneuverable, easy to tote and pure death to the swine. ATO calls it the Ultimate Hog Slayer (or UHS-6.5 for short).

The 6.5 Creedmoor is designed from the outset to be a long-range target round. This long, skinny bullet remains stable out to crazy distances. I have actually seen the ATO guys nail a 12-inch steel plate at 1,000 yards running one of these remarkable handguns off of a bipod. What the UHS-6.5 is really best at, though, is killing pigs.

Advanced Tactical Ordnance uses premium barrel blanks and cuts its chambers as it might for a target rifle. The muzzles can be outfitted with ATO's proprietary blast can or a custom-tuned sound suppressor. The adjustable pistol-stabilizing brace provides a solid shooting foundation without incurring any National Firearms Act baggage. This Ultimate Hog Slayer is unlike any gun you've ever run.

Kit this weapon out with a Streamlight TLR-VIR II and some proper night optics



NO UPGRADES NEEDED.

+ COMES WITH EVERYTHING TO HIT THE RANGE
OR PROTECT YOUR FAMILY

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USA**

BY SARSILMAZ



and you'll have a hunting system that's adequate for anything from coyote to bear, day or night. The choice of glass reflects the mission. The same rig would thoroughly inoculate you and yours against bipedal predators as well. From across the room to a grid square away, the Advanced Tactical Ordnance UHS-6.5 is your one-stop, general-purpose utility gun.

TARGET THE ENEMY

The Streamlight TLR-VIR II will revolutionize a nocturnal hog hunt. The IR light helps identify targets without alerting your prey. The IR laser designator will guide your rounds on target in pure darkness just as might a visible laser sight. However, as it operates in the IR spectrum, there are no telltale stigmata to alert the pigs.

The greatest benefit we've found is the capacity to designate targets. Our little band of pig slayers features a mixed bag of thermal- and night-vision-equipped shooters. The thermal systems will typically identify pigs first, as warm-blooded swine stand out vigorously against a cool background. If we equip the primary thermal shooter with a TLR-VIR II, he can point out the location of hogs under cover or behind brush as well as designate which pig goes to which hunter. The IR light provides illumination so the night-vision shooters can engage safely as well. The result is a proper ambush and an entirely eradicated sounder.

Given their prodigious reproductive rate, 66 percent of an existing pig population must be killed annually to prevent population growth. That's a tall order for such a smart nocturnal animal. Only through the proper application of technology will we ever hope to keep up.

LIGHTS OUT

Feral pigs are bug ugly, tough as rocks and undeniably nuisance creatures. In most places, there is no season and no limit. In many locales, feral pigs are actually classified as vermin.

Several years ago, my son was driving home after dark and struck a massive boar with his car. The impact ripped the front end off of his vehicle. We were incredibly blessed that my son was not badly hurt. When we located the dead pig the following day, we found that he was as big as a small sofa.

Feral pigs are the perfect game animals. Only the most fulminant Leftist might object to our shooting these vile creatures. They are wily, smart and tough, and they remain a clear and present danger to crops. The current estimated national population hovers around 6 million animals.

The Streamlight TLR-VIR II mounted on an Advanced Tactical Ordnance UHS-6.5 adds a whole new dimension to your nocturnal pig hunting. The resulting package is lightweight, powerful, radical and cool. The TLR-VIR II brings technology to bear on the porcine menace. For more information, visit streamlight.com and ATO-us.com. 



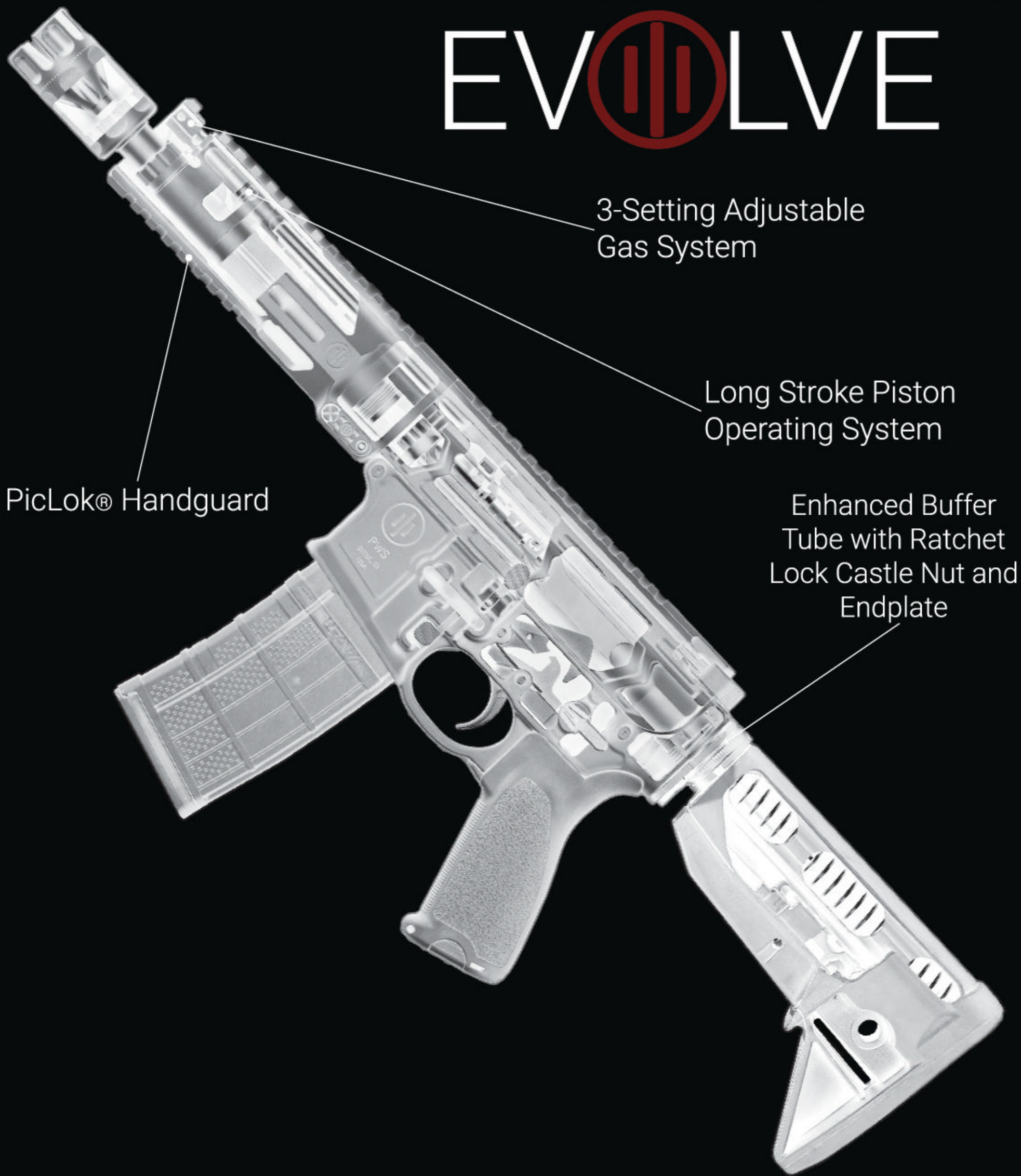
Handy windage and elevation adjustments make the unit very easy to zero.



Results of the lethal combo of the ATO UHS-6.5, a Pulsar thermal optic and the Streamlight TLR-VIR II IR illuminator.

PRIMARY WEAPONS SYSTEMS

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Enhanced Buffer
Tube with Ratchet
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The evening hunt had already been a huge success. Armed with an AR that I had built a few weeks earlier, I had scored hits on two large feral hogs and a coyote. One hour after sundown, it was pitch-black dark, and I had yet another hour of hunting ahead, as I was waiting for my host, Bill Wilson of Wilson Combat fame, to pick me up for supper. Crouched behind my stand, I heard the unmistakable sound of footsteps in the leaves as another hog approached the food plot about 70 yards north of my position. I switched on my Laser Genetics ND3 Sub Zero Laser Designator, which cast a faint, green glow over the section of the opening at which the Leupold 2-7x Hog Plex scope was aimed. Peering through the scope, I picked out the black silhouette of a medium-sized boar. I tracked his movements toward

[BY JAY LANGSTON]

'EM UP

LASER AND LIGHT SYSTEMS TO KEEP YOU IN THE HUNT 24/7

the feeder and waited for him to stop. A gentle squeeze of the JP Enterprises trigger unleashed a 110-grain .308 Barnes TTSX bullet from the 7.62x40 WT. The slug smashed through the 160-pound boar's shoulder, took out both lungs and exited on the front side of the far shoulder. The tough critter sprinted out of the opening into the thick brush, but after 60 yards his death sprint came to a crashing close as he collided with a small oak tree. The ND3's green laser did its job again, helping reduce the Texas wild hog population.

Varmints with nocturnal habits can make hunting an around-the-clock adventure, and going afield with the right equipment can make the difference between success and failure. The proliferation of lights and weapon lasers for self-protection, law enforcement and military use give hunters several options for equipping their rifles for nighttime action.

Even though hunters typically think of their sport as a daytime activity, the swelling number of invasive species such as feral hogs, coyotes, armadillos and other non-game species requires attention. Currently, approximately 41 states allow varying forms of night hunting. (Night hunting regulations vary widely, so be sure to check local laws first.) To that end, we have put together a roundup of weapon lights and lasers that can improve your shooting after dark.

LASER GENETICS

Sadly, Laser Genetics ND-3 Subzero (and its other lights) were outstanding all-weather, long-distance laser designators...when they worked. Its green laser illuminators, such as the ND3 Subzero, and the rest of their lineup sold to BSA. These days, BSA even discontinued these lasers and is down to only two models. But, all is not lost. I found a replacement.





EXUDE →
OD25



ELUSIVE →
OUTFITTER
MODEL

EXUDE

I've seen a lot of change in hunting lights over the years, and this coming from someone who used a carbide miner's lamp to hunt raccoons when I was a youth. LED technology has brought hunting lights a long way over the past decade. When the laser mentioned at the beginning of this article crapped out, I replaced it with not one light, but two. I got Exude's Direct Light Illuminators. The Exude OD40 is available with a mount to attach it to a scope, and that's just what I've done for a rifle that's accurate to its 250-yard visibility range. Then, I mounted an Exude OD25 for whackin' 'dillos in the yard at short range. Now, my wife doesn't even ask me to get the varmints out of her flower beds. She grabs a suppressed .22 LR with the OD25 mounted and takes care of the problem herself. (exudelight.com)

ELUSIVE WILDLIFE TECHNOLOGIES

Elusive Wildlife Technologies' Kill Light Extra Long Range Tactical Rifle Light is a heavy-duty, yet affordable, long-distance tactical light system. This high-powered green LED light, priced at \$140, has an effective range of up to 250 yards.

The Kill Light XLR250 system comes standard with a rapid scope mounting bracket and a standard barrel attachment (for those lacking a scope or rail mount on their guns), as well as a dual station charger, a two-pack of 10-year lithium rechargeable batteries, a tactical tail cap



ELUSIVE →
XLR 250



← NOXX
RED
DAGGER





SIGHTMARK →
LOPRO COMBO



EOTECH ↑
WL1-AA

with coiled cord and pressure switch, and a normal push-button tail cap that turns your light into a long-range flashlight.

The XLR250 is 7 inches long and with a battery weighs approximately 9 ounces. EWT's lights are made from T-6 aircraft-grade aluminum with a clear glass lens. Elusive Wildlife Technologies use a special CREE LED that emits an incredible amount of green light through an extremely accurate and focused highly polished reflector. This light, with its green LED, will run two to four hours continuously per battery.

Recently, the wildlife agencies for Texas, Louisiana, Florida and Hawaii issued EWT light kits to their animal damage control officers. The package includes an extreme long-range XLR 250-yard RED flashlight, a Silent Halo Shield, a Rapid Scope Mount, a barrel mount, a tactical-style tailcap with a wired on/off switch, a Dual Mode RED XLR 100 scanning light, an adjustable hat with light mount, two dual station smart chargers with car and wall adapters and four extended-run-time 3000 mAh batteries. Outfitter models are available, too, for setting up at hog feeders. For more information, visit elusivewildlife.com.

NOXX RED DAGGER

The Red Dagger is a predator hunting light that's compact and produces a tremendous amount of light. Its key feature is its ability to focus a high-intensity red beam up to 200 yards or a broad beam at close range. To change the beam, sim-

ply slide the head of the light forward or backward. By projecting a red light, the Dagger allows you to walk to your deer stand without spooking game like you might with a traditional white light. The 5-watt LED light projects a high-intensity beam that penetrates darkness, fog or smoke like no other flashlight of its size available today. Using the latest technology and the best 5-watt CREE chip on the market, the Red Dagger creates a bright, long-lasting compact light at a low price. Holding this compact, lightweight flashlight is like having a spotlight in the palm of your hand. And with a lifespan of 100,000 hours, the light is guaranteed to last you many a hunt.

The Red Dagger is made of aluminum alloy, is 4.25 inches long and weighs 3.5 ounces. The intensity is more than 12,000 candelas. It is powered with three AAA batteries. The recessed rear-mount power button is an end cap switch that is easy to access. The light fits most standard gun mounts. (noxflashlights.com)

SIGHTMARK LASER

The Sightmark LoPro is a low-profile green laser that can be mounted in front of a riflescope without interfering with your field of view. Designed to be mounted on Picatinny or Weaver rails, the LoPro Green Laser can also be mounted on the side of the quad rail. The laser is offset for clearing front sight post.

Featuring 1-MOA click value adjustments, the hand-adjustable windage and elevation turrets allow the user to zero in

the laser dot for close-range shooting. Visibility ranges from 50 yards in the daytime to 600 yards at night.

Constructed from a high-performance thermoplastic and finished in matte black, the LoPro Green Laser is heat, corrosion and impact resistant; waterproof; and shockproof.

Reliable and durable, the Sightmark LoPro Green Laser takes one CR123 battery and has 27 hours of battery life, and it comes with Velcro strips so switch can be mounted for easy turn on/off. Several great options are available, and all are very reasonably priced. (sightmark.com)

EOTECH LASER & LIGHT

Last of the illumination systems under review is EOTech's classic WL1-AA, the first tactical weapon light designed to run on readily available AA batteries. Available in two models—light only and light plus laser—the WL1-AA produces 150-plus lumens of light for up to 90 minutes. Sturdy and compact, the WL1 can be quickly, and tool-lessly, fastened and detached to any Picatinny or Weaver-style rail via its Quick Release Rail-Grabber—making it the ideal grab-and-go light. An intuitively positioned button allows for easy toggling between three light settings—momentary on, constant on and strobe mode—and a four-position adjustment crossbar allows for precise positioning and redirection fore and aft on the rail. The light-only WL1-AA sells for \$249.99, and the laser package for \$399.99. (eotechinc.com)



SECOND ZERO



SHOTLIGHT

AXEON!

MORE THAN JUST OPTICS



ABSOLUTE ZERO



EXUDE

A LOOK AT SOME OF THE BEST PRODUCTS AXEON HAS TO OFFER

[BY FRANK MELLONI]



DOG SOLDIER ➔



MDSR1 ➔



NIGHTVUE ➔



If you've ever been sitting at the range, muttering "I wish someone would make XYZ," well, odds are that someone is Axeon, and the XYZ will be exactly what you are looking for. Sure, Axeon is most commonly associated with optics, but the truth is they have much, much more to offer. To illustrate my point, I reached out to their marketing department and requested a package of the most mixed-and-matched equipment they could muster. A massive box showed up on my doorstep, and with that, I decided to spend the entire summer of 2020 learning about Umarex's child company, Axeon.

HOLY HEADLIGHTS!

Illumination is big business in this country, and people from nearly every walk of life have a use for a compact, high-output light source. The Exude line of flashlights is so innovative that they spun off their own brand. Well, to be completely straight, these aren't technically flashlights, as they don't waste lumens reflecting light off a mirror. No, the Exude projects its light directly from an oversized LED, maximizing its brightness and efficiency.

After charging it up and shining it around the neighborhood, I realized that I needed to put this thing through some real use. Now, there are a lot of different ways to test flashlights, but for my money, if it ain't good for crabbing it ain't worth squat. Crabbing at night is about the simplest form of fishing that you can imagine. Here on the Eastern Seaboard, all you need is a net and a bright



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↑ The NightVue is useful not only for hunting but also for suburban surveillance.



→ Adding a light or a laser without adding additional snag points is simple with the ShotLight or ShotLine. Even on short, defensive barrels, the author experienced little to no protrusion in his install.



← By using the included (and optional) high mount, the MDSR1 plays well with A2 sight posts.

flashlight. If the light is bright enough, the crabs come up to it and follow it wherever it shines. In my testing, we were able to crab for the full night on a single charge and had plenty left over for a second trip. A bushel of blue-clawed deliciousness proved the Exude light's effectiveness to me, not to mention an annoyed neighbor who is exactly 214 yards across the way. (Thanks for being a good sport, Chris.)

FROM A PLACE YOU WILL NOT SEE

Spotting game at night is difficult—and potentially pricey. If you already have a good pair of daytime binoculars, it's hard to reinvest in something that can only spot game at night. That's the very premise behind the Axeon NightVue. The NightVue is a simple green-laser-emitting unit that can attach to just about any pair of binoculars, giving you a bright, long-range laser to light up whatever it is you are trying to see.

Installation was tool-free and took less than five minutes, as all that was needed was to remove the front screw and replace it with the NightVue and one of the provided replacement screws. Although I was able to attach it to my Bushnell Trophy binos with little effort, I did have to make a 5-cent investment for an additional washer to snug it up

a bit. While the NightVue charges off a USB, it came with enough juice to drive around the neighborhood and spot raccoons and possums on trash night.

LOTS OF DOTS

You can't call yourself an optics company these days unless you offer at least one red-dot or reflex sight, and Axeon offers several. In my box, I was blessed with the Cadillac of their lineup, the MDSR1. This little red-dot sight comes with mounting hardware that meets the height requirements for a traditional rifle or shotgun, or a modern sporting rifle. The MDSR1 is built to be ultra-compact and features a 30,000-hour battery life from a single CR2032 battery. It also features an automatic shutoff, because let's face it, batteries don't die from use, they die from forgetfulness. I tested my sample on a punishing Mossberg 930

Slugster and ran close to 100 slugs through it. I was thoroughly impressed with its ruggedness. Let's just say the optic took the abuse better than my shoulder did.

FUN WITH SHOTGUNS

From harvesting waterfowl to caving in someone's chest in your living room, shotguns serve a variety of purposes. Arguably, their usefulness is limited only by their peripheral equipment—or lack thereof. This is where the ShotLine and the ShotLight shine (sorry). By replacing the magazine cap, the home defender can add a bright illumination device or a red laser sight. Both units come with the mounting hardware for Mossberg, Remington and Winchester shotguns, covering a wide array of scattergun owners in one shot (not sorry for that one). It's worth mentioning that it also fits the Maverick 88, to which I mounted both units in my test.

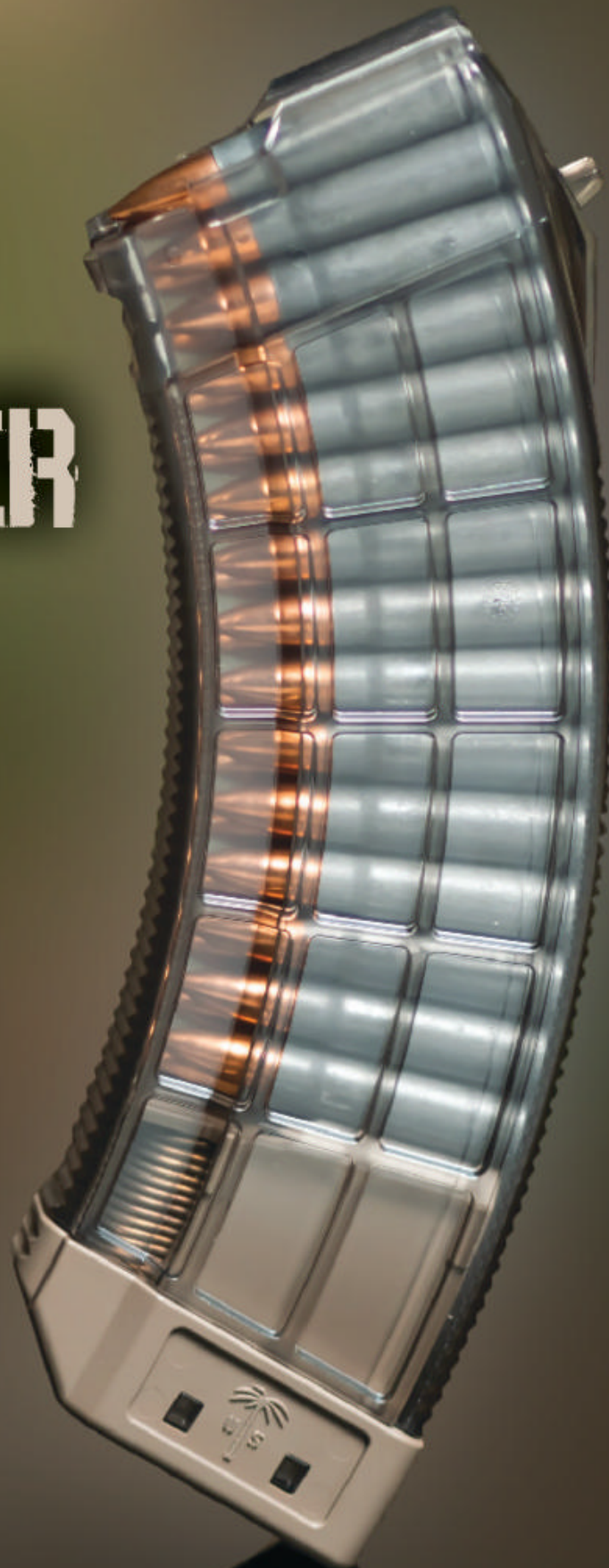
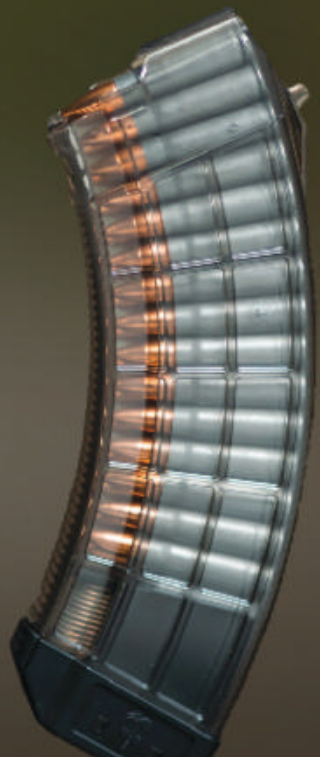
Neither impacted the overall length of the shotgun greatly, adding just about 1 inch of width with the ShotLight, while the ShotLine sat about 0.25 inches below flush. Again, we tested both units with 100 rounds of 12-gauge ammunition, and they did just fine. Odds are if you need that many rounds inside the home, you aren't fighting off a burglar, you're filming *John Wick 5*.

AHEAD OF THE CURVE



WEATHER
ANY
STORM

ALL NEW
AK30R POLY FDE





The Dog Soldier scope makes a great addition to any hunting rifle. Tremendous light transmission and a tactical reticle help to make the optic a great fit for a target rifle, too.



ABOVE LEFT: The Absolute Zero can be attached directly to a rifle, or to the optic itself. The author prefers to use the 6 o'clock Picatinny section (when available) for ease and accuracy. **ABOVE RIGHT:** The author found the 11.5-MOA Second Zero to be spot on.



YOU CAN'T HAVE CANT

The Absolute Zero takes the traditional laser boresight and doubles its effectiveness simply by doubling the lasers. Instead of one beam shining through the bore, the Absolute Zero attaches to either a Picatinny rail or the scope itself, and shines two beams downrange. By using the two dots, you can not only crank your turrets until the crosshairs are on paper, but you can rotate the scope tube to level them as well.

I experimented by boresighting my hunting rifle in the basement with just 15 yards to work with. The result was a first-round hit on paper, saving me some pricey specialty ammo. The unit also comes with a reflective grid target, in case you wish to undertake the process right on the range, allowing for longer distances and instant confirmation.

GLASS, OF COURSE

Axeon is best known for its magnified optics, so we rounded out this review with their latest, the 4-16x Dog Soldier scope. Built with the input of Steve

Criner himself, the Dog Soldier optic is built with maximum light transmission in mind. The idea is that coyote hunting can take place in broad daylight or under the cover of darkness. The goal is to have an optic that can handle both situations.

I liked the dual-color illumination, which suits not only shooters' tastes but a variety of light conditions as well. I also respected that the reticle was full of very usable subtensions without being overcrowded. I tested my optic on a Mossberg Patriot Predator, and it survived .308 Win recoil without changing zero or losing focus. And I was able to impact out to realistic hunting distances just by holding over and using the hash marks. All in all, it was just a good, no-nonsense hunting optic that will live on, hopefully to put fur on the wall this winter.


LAST IS SECOND

I finished my review with the most unique product Axeon makes, the Second Zero. By using prisms, the Second Zero shifts the target image by a specific amount, making long-range

elevation adjustments a snap. These are available in +4.3-MOA or +11.5-MOA models, and both come in the rail-mounted variety or with a clamping system intended to mount directly to the bell of your scope. I slapped the 11.5-MOA Second Zero on the end of the Dog Soldier optic and mounted it to a brand new Anderson 20-inch, bull-barreled upper for my testing to see exactly how precise it was.

MOA math is easy at 100 yards, so I hung out a target and fired a group with and without the Second Zero flipped down. The shift was indeed 11.5 inches on the nose, as confirmed by the sub-MOA Black Hills MK262 Mod 1-C ammo. I chose this ammunition because even 1 MOA of error is enough to leave me questioning how good a job Axeon did.

Later that summer we stretched out our build and found that we could center a strike on a full-sized International Practical Shooting Confederation (IPSC) target at 250 yards with the 4.3-MOA version. And with the 11.5, we could hit at 425 without having to dial one iota. I like the Second Zero because it is not only fast, but also a great way to obtain that extra come-up if you're maxed out and don't want to reinvest in a new scope or mess with shims.

My Axeon "Summer of Love" wrapped up with a much closer look at their website, showing me exactly how broad a lineup they have. It seems they offer a solution for every type of shooting sport, whether you're a hunter looking to do better at night, a competitor looking to place faster shots or just your everyday homeowner looking to mount a scope or be prepared for a bump in the night. Whatever your game, Axeon has got you covered, and it has been my pleasure illuminating one of the best-kept secrets in the firearms industry. For more info visit axeonoptics.com. 



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MRAD DASH

F-CLASS RETICLE
MOA DOT

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- 1ST FOCAL* / 2ND FOCAL
- MODEL# SM13042PRS / SM13042FTR
- INCLUDES SUNSHADE & BATTERY
- *only SM13042PRS is 1ST focal plane

F-CLASS RETICLE
MOA DOT

- LATITUDE 8-32X60
- 2ND FOCAL PLANE
- MODEL# SM13043FTR
- INCLUDES SUNSHADE & BATTERY

F-CLASS RETICLE
MOA DOT

BENCHREST
MOA DASH

- LATITUDE 10-40X60
- 2ND FOCAL PLANE
- MODEL# SM13044FTR / SM13044BR
- INCLUDES SUNSHADE & BATTERY



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MATTER OF FACT

VIRIDIAN'S WEAPON LIGHT/LASER AND CAMERA COVERS NOTHING BUT THE TRUTH

BY ROBERT JORDAN



The name Ferguson surpassed its association as a Scottish clan to become a rallying cry for social injustice in 2014. Minorities united against police brutality while law enforcement held up the Michael Brown shooting as an example of how media bias and selective reporting can blatantly alter the perceptions of an event. The racial divide and animosity created by irresponsible, biased journalism has ignited a powder keg that is still reverberating today.

But what if we could have seen things from the officer's point of view from the very beginning? Wildly different versions of the events, some from people who were not even present, were publicized as fact, and a city erupted into violence that lasted for weeks. This event was the catalyst that made Brian Hedeem, president and CEO of Viridian Weapon Technologies, begin a quest to provide video evidence that would exonerate good shoots, vindicate bad shoots and do both quickly.

HARDWARE VS. DATA STORAGE

Body cam companies make cameras that cost about \$700, but that isn't where they make their profits. These companies specialize in data storage and lots of it. Thousands of hours of video are recorded by a medium-sized

police department each day, and all of that data has to be downloaded, preserved and stored. Doing this can cost nearly \$10,000 a year per camera. This represents a huge investment for most departments.

Viridian was never in the data-storage business. The company started—and remains—in the hardware manufacturing business, namely, tactical weapon lights and lasers. The company's solution to capturing critical incidents isn't to have Big Brother follow every cop around every minute of the day, but simply to record those possible life and death moments and to do it from the best vantage point possible. With a camera mounted on each officer's gun that also serves as a tactical light, Viridian invented a novel solution. Best of all, unlike a body camera, no one has to worry about turning it on and off or having it on throughout the entire shift. Instead, it automatically comes on when the weapon is drawn from the holster.

THE FACT DUTY

The Viridian FACT Duty has very similar dimensions to a SureFire X300. In fact, if you have a Blackhawk or Safariland holster that's made for most modern weapon lights, it will fit just fine. I pulled





out several Safariland 6004 and ALS holsters that I used on duty through the years, and they all fit fine. In addition to the camera, the FACT Duty also has a 500-lumen light that can be set to strobe or constant. Ambidextrous buttons allow the user to bump it on or off with a thumb or trigger finger. Viridian even has a model now that has a green laser due to the popularity of lasers with K9 handlers and the guys who carry the shields on raids.

The FACT Duty has a rechargeable battery that will last for approximately 3.5 hours. Considering my CR123 batteries will only run my tactical lights for about an hour and I only have to

replace them once or twice a year, that's pretty good. The unit holds 32 gigabytes of data, which equates to six hours of 1080p-quality video and audio. The recording is password protected to prevent tampering, and typically, only someone from evidence or the chief will have the proprietary software to download the footage. The unit is also waterproof.

Viridian knew that a gun-mounted camera was entirely new ground in the law enforcement community. Proving that the product worked and worked well would take careful testing and tweaking. The company already had Instant-On technology and could easily have rushed the product to market but instead took years of testing and modifying before releasing it.

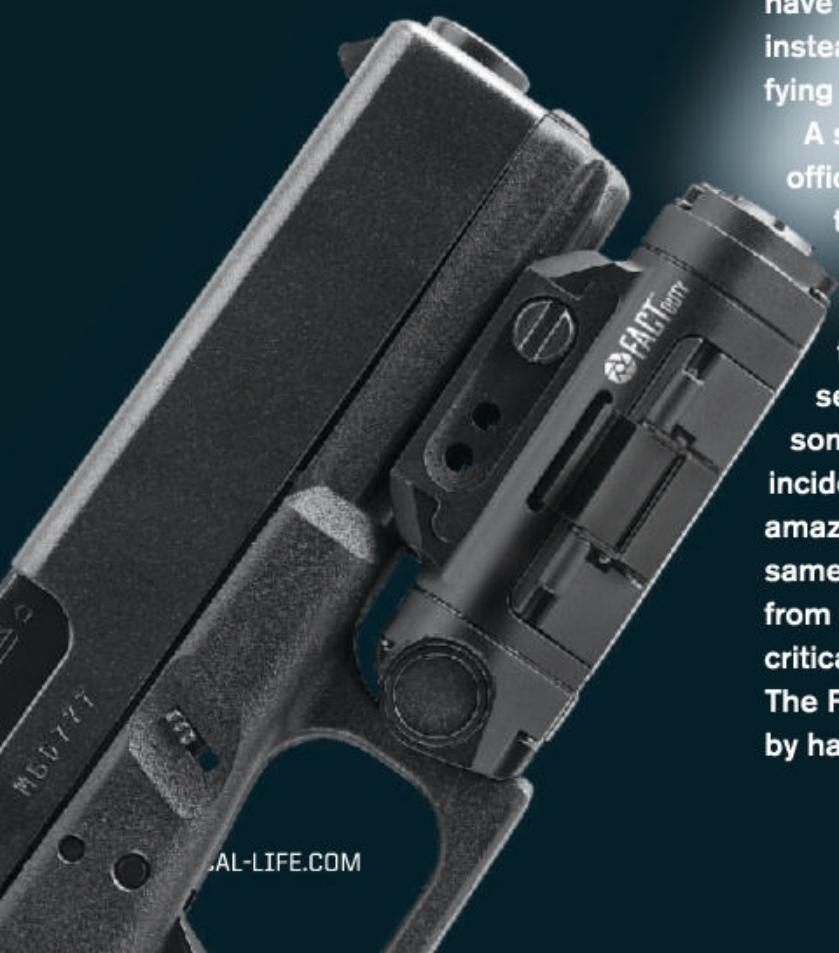
A study of body-camera footage in officer-involved shootings showed that more than half of the time, the camera failed to capture critical information that led to the shooting. As a cop, I've seen a lot of dash-cam and now some body-cam footage from critical incidents over the years, and I've been amazed at how vastly different the same scene appears when viewed from two different angles, because critical behavior is often obscured. The FACT Duty aims to prevent that by having the camera mounted as far

forward into the action as possible and diminishing the likelihood of having the lens partially or fully blocked.

TESTING

I received a FACT Duty to try out on the range, and it was almost a waste. I could forget about it. For me, the end-user, it was simply a tactical light on my gun—and a pretty good one at that. At 500 lumens, the light is powerful enough to blind a bad guy but not so powerful that it bounces back off a white wall and blinds me. A light touch turns on the light momentarily until you remove your finger. A harder tap turns the light on and off completely. Meanwhile, the camera records when it's out of the holster and turns off when I put it back. At \$749 with a Safariland holster, this is very worthwhile insurance.

Law enforcement, their tactics and their split-second, life-and-death decisions are under scrutiny in a way that is unparalleled in history. The Viridian FACT Duty is an unbiased witness that can exonerate that officer. It's a great tool, and I know very few cops who wouldn't be happy to have it attached to their gun. Viridian offers a free testing and evaluation program to any department that wants to try it out, so give them a call. Your officers will thank you. For more, visit viridianweapontech.com.





SECTOR OPTICS' G1T2 MIGHT JUST BE THE GREATEST OPTIC YOU'VE NEVER HEARD OF

[BY ROBERT JORDAN]

W

hen it comes to night vision and thermal imagery, nothing tops experience. Sure, seeing better at

night and having a scope where body heat literally glows sounds good, but you cannot truly appreciate it until you use it. I remember turning down carrying a PVS-7 night vision on a midnight op intercepting drugs on the Mexican border in the late 1990s. I had worked night shifts almost exclusively for the Border Patrol, and I knew my way around. I thought NVGs were cool but not worth the tradeoff of lost vision adapted to the dark, the loss in depth perception or the inability to aim my rifle. Nowadays, I recognize the advantages of such technology because I learned how to use it. Experience and good equipment mitigate the disadvantages.

I love to play with thermal scopes. I use them to look for insulation leaks, track wounded animals and spot coyotes before anyone else sees them lurking in high brush. A few years back I even decided to use a head-mounted thermal the same way I use PVS-14 night vision and navigate my way across open terrain at night. Mistake. Thermal differentiates terrain

THE DO-IT-ALL SCOPE





with different temperatures. It does not differentiate terrain of the same temp. A 2-foot drop or a curb or a rock often look exactly like the terrain surrounding it. Thermal excels at finding warm-blooded mammals and the traces they leave, but it sucks at navigating uneven terrain in the dark.

MEET THE SECTOR

I met with the the Torrey Pines Logic folks at last year's SHOT Show to see the new Sector Optics prototype of the G1T2 scope. Describing this thing takes a while. It starts life as a 1-8X riflescope, but then throws in a lot of bells and whistles. I think the 1-8X was a wise choice, when you consider that

thermal imagery at distance is tough unless you have a huge, heavy scope and a tripod and batteries. A scope paired with thermal at much shorter distances is far more practical.

The regular optics of the 1-8X are surprisingly good. Even at 8X, eye relief was remarkably forgiving. I repositioned my head far forward and back to approximately 3 inches before the view started to diminish. That may not sound like much, but on an AR rifle where variable buttstocks allow perfect cheek placement, it's gold. Even a lot of top-end tactical scopes used on the battlefield are less forgiving.

The reticle is a post-and-duplex style with an illuminated reticle with

11 power settings. I had to go up to level 4 to see it with my naked eye in daylight. The power dial on the left side rolls either way, and you can go from 0 to 11 with one click. The CR2032 battery sits under the dial. The reticle adjustments are 0.5 inch at 100 yards. I prefer 0.25 inch, but few shooters can hold the gun still enough to notice a difference, particularly while hunting a moving target. My EOTech on my service rifle has the same 0.5-inch adjustments, and I've got no complaints.

MORE TO THE STORY

Everything so far sounds like a standard hunting scope with an illuminated dot reticle. But one glance at the scope



THE DO-IT-ALL SCOPE



The Sector Optics G1T2 is special because it blends so many different features together into a light and easy-to-use package.



“THE REGULAR OPTICS OF THE 1-8X ARE SURPRISINGLY GOOD. EVEN AT 8X, EYE RELIEF WAS REMARKABLY FORGIVING.”



You scan for your prey using the normal scope. However, as every hunter knows, animals blend into their environment. If they aren't moving, they blend really well. But, as your scope crosses them, their body temperature makes them jump out in the thermal screen. Can't see what is in that dark bush? No problem, as your scope reticle hits it, the thermal camera does too. It is like having a regular scope and a thermal scope at the same time. Each cancels out the disadvantages of the other.

So why is there a second screen for the thermal scope up and to the left of the normal tube? That is for use at night. If you try to look through the normal scope at night, you cannot see anything. The small picture-in-a-picture is nice, but is far too small a field of view to use at night. You would be worn out in minutes swinging the rifle back and forth and still not cover much ground. The larger screen has a much wider field of view. And it has crosshairs built in so you can still use it to aim and fire. The screen is large enough that you can still see it comfortably after you bring the rifle down out of the pocket of your shoulder. A raised lip around the screen helps to block the ambient light from giving away your position. Plus, the screen is set up to be pretty dark, all by itself. You also have the ability to have both thermal screens on, or toggle either one off. The

tells you that this thing is anything but ordinary. There is a weird-looking box attached to the end of it. After you hold the center button and toggle the unit on, there is a thermal heads-up display that sits up and slightly left of your main scope. It has a 1.17-inch by 0.95-inch screen, according to my calipers. The same thermal view that is on that screen is also visible inside the regular scope (Sector calls it the ID: Internal Display) at the top of the circle. It is literally a picture-in-a-picture. While this sounds redundant, it isn't. Each screen serves a different purpose.

The ID thermal screen inside the normal scope is pretty handy. It is magnified, and it is easy for your eye to transition between the normal scope reticle and the thermal view just above it.



Despite the wide array of features, the author found the G1T2 scope surprisingly easy to operate.





A POCKETFUL OF KICKASS



My first introduction to thermal cameras was 20 years ago when three of us would hike in near the U.S./Mexico border with a camera, a tripod and 60 pounds worth of batteries. Since then I have discovered the joys of handheld units. No, you cannot zoom 10 miles to pick up a guy with a load of drugs on his back, but you can track a wounded animal during a hunt, figure out which cars have been running in the last

hour during a surveillance, or see clearly where your insulation isn't sufficient in each room of your house.

Sector Optics produces a range of thermal cameras. Its introductory hand-held model, the T20X Thermal Imager, is less than 3 inches long so it will fit in your pocket. It zooms from 3 to 5.5X and can be used in white hot, black hot, green or color modes. It can be used as a handheld device or it can be mounted on a gun using

a 30mm scope ring and, of course, it has reticles that can be adjusted so you can sight in your miniature thermal scope and make it a thermal weapon scope. It runs for approximately four hours on a single CR2 battery, but it has a motion sensor to shut it down when not in use. MSRP is right at \$1,000, so you won't have to sell your car to be the guy with the coolest toy at hunting camp this year.

— Robert Jordan

big screen has multiple color setups and can go from white hot, to black hot, to red and even green screens. The little heads-up display inside the scope stays yellow, with white hot. Both thermal screens have the ability to zoom from 2-8X. This is an optical zoom, not a digital zoom. That means the image does not become more pixelated.

HITS KEEP ON COMING

So what more could you ask for? How about a built-in rangefinder that displays distances on both screens? Yeah, it has that too. The remote push button plugs into the USB-C port on the side of the large screen. The cord is approximately 7 inches with a large, rubbery button on the end with adhesive to stick on your forend or wherever you like. I put it at

the 10 o'clock for my thumb and it was perfect. Again, you can push it down for the range distance once or hold it for continuous. The G1T2 can also take screenshots by quickly pressing the center power button. A USB-C cord will plug into the same port as the rangefinder button for downloads to your computer.

The CR2032 battery powers the illuminated reticle, but the G1T2 also takes two CR123 batteries to run everything else. You can also switch it over to run on rechargeable 18650 batteries. The 3-volt batteries will run the unit continuously for about 8 to 9 hours, which is a long time for a thermal scope.

With all these features, I expected the user manual to read like *War and Peace*. In reality, a quick reference guide, with

pictures printed on the inside lid was all I needed. The G1T2 also comes with an eight-page user's manual, but you don't need it to get started. The whole system was surprisingly easy to use.

That said, no scope is perfect. The thermal imagery lags a little when panning. It's not noticeable most of the time, but if you are hunting hogs at night from a side-by-side, you will probably wish it had a faster processor. Also, rangefinder distances take about 0.5 second between button press and the screen actually posting the result. It isn't instantaneous, like some newer, handheld rangefinders. But on the other hand it doesn't suck down batteries like they do, either. I love the built-in rangefinder, but I wish the scope had some type of mil-dot reticle or hash marks to use for holdovers when you are shooting at distance.

WHAT THE FUTURE HOLDS

I interviewed Mike Konrad, global sales manager of Torrey Pines Logic's brand Sector Optics. He explained that the internal display (ID) has tremendous growth potential for third-party developers. ID is an open standard, and other sensor vendors (ballistic, thermal, wind, video and so on) can develop apps to connect their devices to a scope's intra-ocular heads-up display. As is the case with heads-up displays, it is invisible inside the scope until it is turned on. In subsequent versions, it will be Bluetooth-enabled, so anything that can be displayed on your phone, including any app, can be sent to the scope, including pictures, video and texts. Imagine a SWAT sniper getting an updated pic of the target at the scene of a barricaded subject with hostages in real time before taking the shot.

The G1T2 doesn't have any features that you cannot find elsewhere. It excels because it blends so many features together into a light and easy-to-use package. I thought it was overly complicated, until I tried it out for myself. There is no substitute for personal experience.

The G1T2 System carries a MSRP of \$4,080. That's not too shabby when you consider all the duties it can handle. For more information, visit sectoroptics.com



THE DRONE ZONE

HOW FLIR TECHNOLOGY IS FIGHTING BATTLES FROM THE SKY

[BY DONALD J. MIHALEK]



A man in a small town in Massachusetts went out in his yard one day, intent on checking his boat. It was 24 feet long and probably hadn't been in the water in a while, so it needed a once-over to ensure it was ready for the boating season. As the man approached his boat, something didn't seem quite right. Earlier that day, his entire area had been put on lockdown, with schools closed, public transportation service suspended and everyone told to stay inside their homes. Police were out in force searching for a dangerous suspect.

As David Henneberry lifted the cover of his boat, he was startled to see something he wasn't expecting: blood. As he continued to look further into his boat, the blood trail led to a body, one very much still alive. The date was April 19, 2013, and the police were looking for this particular body, that of Dzhokhar Tsarnaev, who with his brother Tamerlan became infamous for their terrorist bombing of the Boston Marathon.

At this point, though, Henneberry wasn't exactly sure who it was—but common sense dictated it might be the terrorist suspect. Henneberry immediately called 911, and the police arrived en masse. They surrounded the boat, including with a Massachusetts State Police (MSP) helicopter.

This helicopter was specially equipped for this situation with some





SPEC BOX

R80D SKYRAIDER

TOTAL LENGTH:	31.5 inches
WEIGHT:	9.9 pounds (airframe, arms, legs, four batteries, no payload)
STANDARD PACK:	18.7 pounds (aircraft, base station, HDZoom 30)
TYPICAL ENDURANCE:	Approximately 50 minutes with high-endurance propulsion system; more than 40 minutes with standard propulsion system. (Endurance specifications measured with forward EO/IR payload. Actual flight time varies based on payload and operating conditions.)
MAXIMUM GROUND SPEED:	31 mph
MAX ASCENT SPEED:	13 feet/second
MAX DESCENT SPEED:	9 feet/second
TEMPERATURE:	-22 degrees F. to 122 degrees F.
WIND:	40 mph sustained; 56 mph gusting
PRECIPITATION:	IP-54, MIL-STD-810G for salt mist/rain
DATA LINK FREQUENCY:	900MHz, 5.8GHz + other frequencies and waveforms
RADIO RANGE:	Up to 5 miles with standard base station
MISSION DATA:	AES 256-bit encryption with secure key exchange
LAUNCH TIME:	3 to 5 minutes



The R800 Skyraider is both small and multi-missional and can be used to protect and perform almost any mission.

amazing technology, a Star Safire III infrared camera manufactured by FLIR. MSP had also recently upgraded their cameras with a Geo-Pointing Module feature that keys into a target, so that if the helicopter rotates, the camera stays pointed at the target.

This camera was vital because it allowed the police to literally see the terrorist in the boat through the tarp, by his heat signature. Tsarnaev's heat signature glowed white hot on the screen, and the police could watch every movement he made while hiding in the boat.

This ability to detect heat and see through objects is one of the greatest assets FLIR technology brings to any battlespace.

THE MAIN PLAYER

FLIR Systems designs, develops, manufactures, markets and distributes technologies that enhance perception and awareness. The company uses

thermal imaging, visible light imaging and video analytics. They also build measurement and diagnostic and advanced threat detection systems into their products.

Founded in 1978, FLIR pioneered the development of high-performance, low-cost infrared (thermal) imaging systems for airborne use. FLIR saw thermal imaging as a way to detect the infrared energy (heat) emitted by people, objects and materials. The company's infrared technology allows an operator to see in total darkness, adverse weather conditions and through smoke and haze. The heat signature becomes clearer against the surrounding environment, as the Boston bomber case shows.

Recently, FLIR has worked to apply their technology and infrared capabilities to multiple platforms, including handheld, mounted and maritime, and now for drones and body temperature scans.



THERMAL SCANNING

As the COVID pandemic has impacted the world and crippled many institutions' ability to function—including theaters, ballparks, corporations and most government buildings—mitigation measures are being sought to allow these institutions to return to more normal operations.

One of the mitigation measures that has been widely considered is taking temperature scans of everyone entering a facility. The current U.S. Centers for Disease Control (CDC) guidelines state that if you have a temperature of 100.4 F. or higher, you are in the high-risk category for potential infection. Follow-on scans would need to occur as a way to verify, but the medical community has stipulated that temperature threshold as an effective means of identifying those who might be fighting off some type of infection.

FLIR thermal cameras are used to detect heat radiation and can identify the surface temperatures of objects and people. These are non-con-

tact screening tools used to detect differences in skin surface temperatures, as well as pattern changes. FLIR is registered with the U.S. Food and Drug Administration (FDA) to provide its thermal products in screening for elevated skin temperatures.

Thermal imaging has also been used for other environmental factors, such as chemical, biological, radiation and nuclear exposures. FLIR cameras are capable of detecting these changes in the environment and can also help measure safety levels to enable mitigation measures to be implemented. Many sectors of the economy are using this type of screening today. As FLIR technology has evolved, so have its applications and potential uses.

FLIR DRONES

Drone use by the public safety community is expanding rapidly these days. A capability that once used to

involve a remote pilot—and an aircraft that was essentially a miniature airplane—has been reduced in size to include pocket-sized devices.

FLIR's Director of Product Strategy Mark Holden said, "As the technology has evolved, so have the uses of drones and our ability to leverage those platforms and thermal imaging." As more and more agencies are in search of an "eye in the sky" asset that doesn't require a pilot and is easy to use, FLIR is providing an array of easy, almost "plug-and-play" platforms that are adaptable to multiple missions.

One of FLIR's marquee products is a small Unmanned Aerial System (UAS) called the R80D SkyRaider. Holden said, "During combat operations in Iraq and Afghanistan, often runway size and takeoff was an issue. Developing small, UAS-type aircraft that didn't have those limitations and

could essentially be carried in a backpack by troops became a priority."

The R80D SkyRaider is considered by FLIR to be an advanced, multi-mission UAS. It was developed for the Department of Defense (DoD) and other government customers and is capable of multiple different operations. It can be managed by a single operator and can carry up to 4.4 pounds of payload. Not only is it fast, but its integrated artificial intelligence (AI) computing devices could allow it to be sent on a mission and return without human guidance.

For surveillance, SkyRaider can view up to 5K resolution. It can pick up radio chatter and detect and track up to 30 moving targets. This capability also allows it to determine a target's direction and speed of travel, which is useful if trying to intercept, mitigate or track.

Shrinking down further,

"THIS ABILITY TO DETECT HEAT AND SEE THROUGH OBJECTS IS ONE OF THE GREATEST ASSETS FLIR TECHNOLOGY BRINGS TO ANY BATTLESPACE."



Thermal imaging for heat signatures can rapidly identify problems before they occur—very useful for a number of applications.



These new, advanced multi-use drones can be used to deliver much-needed aid or protect individuals, among a number of other uses.



→ **The Black Hornet drone is small in size but powerful in purpose.**

FLIR's smaller Black Hornet PRS UAS fits in the palm of your hand. According to Holden, "This UAS has 2 km of range, and we see it as a real game-changer. Its tiny size makes it great for surveillance. With 25 minutes of flight time and the ability to be configured to handle six different loadout packages, the Black Hornet puts power into the hands of any operator."

Holden went on to say, "We are seeing a trend to more capable and more autonomous UAS units that are mission driven. These trends tend to be toward vehicle- and aircraft-mounted UASs. As we progress, we are developing technology that allows a pilot to fly up to 12 drones at a time, equipped with jammers, acoustic detectors and radio frequency analysis and drop capability." In time, one UAS pilot will be able to control a small air force of UASs.

FLIR is also using its technology during this worldwide pandemic in an integrated

fashion along with their UASs. Since one of the indicators of infection with this coronavirus includes elevated skin temperature, the ability to identify those with high temperatures is increasingly important.

During the pandemic, some parts of the world, including Italy, India and even New Jersey have used drones to enforce stay-at-home and social distancing orders. In California, drones are being used to track and

perform outreach for homeless populations, allowing the state to maintain social distancing protocols while trying to assist those in need.

THE FUTURE

As our world evolves and its needs change, drones and their applicable technology are sure to continue to adjust and find practical and vital uses.

Back in Boston, despite being wounded, the terrorist Dzhokhar Tsarnaev fired

at the police from inside the boat. The police were able to keep a safe distance and still monitor his movements, thanks to the FLIR-powered airborne eye in the Massachusetts State Police helicopter. Before his capture, Tsarnaev reportedly scrawled a note inside the boat indicating the Boston bombings were committed in retaliation for U.S. wars in Muslim countries. This very dangerous criminal was safely apprehended and police officers kept safe due to FLIR's technology.

This type of threat mitigation has been used for tracking and apprehending suspects and now can be used to mitigate other dangers, both visible and invisible. Protection of any type is best done with a layered approach, and FLIR can add a powerful layer of mitigation to any dangerous situation. For more information, visit flir.com.

Editor's Note: Drone use can definitely assist positively in the areas of medical drone deliveries, broadcasting useful information, spraying sports stadiums and streets with disinfectant, but there is always the slippery slope to consider. We must protect against pervasive surveillance and warehousing of data about citizens. As the Brookings Institution puts it, "legislators should enact retention policies and procedures that make it more difficult for the government to access information as time passes. Eventually, information collected by the government should be destroyed at the end of a pre-determined period of time." Our individual rights must be protected at all costs. 🇺🇸

SPEC BOX

BLACK HORNET PRS

ROTOR DIAMETER:	4.8 inches
TOTAL LENGTH:	6.6 inches
WEIGHT:	Less than 1.16 ounces
ENDURANCE:	Up to 25 minutes
MAXIMUM GROUND SPEED:	Approximately 20 feet/second
TEMPERATURE:	14 degrees F. to 109.4 degrees F.
WIND:	17.3 mph sustained; 23 mph gusting
PRECIPITATION:	0.1 inch/hour (light rain)
LAUNCH TIME:	30-120 Seconds depending on launch mode

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FIREBALL TAMING

EXPERT GUIDE TO LOADING REDUCED-FLASH AMMO

BY KYLE LYNCH



For the better part of the past two years, this column has

focused on recreating popular tactical ammunition at home with commercially available equipment and components. Thus far, we've created clones of popular tactical loads for the 5.56mm, .308 Winchester, 300 Blackout, 6.8 SPC, 9mm and .45 ACP. Generally, matching the velocity and accuracy of each load has been the primary goal.

Having handloaded clones of these tactical loads allows us to zero, practice, train or hunt with the equivalents to our selected defense/duty loads, without the high cost of factory ammo. However, to this point, we have not looked at some other factors that make tactical ammo desirable. Foremost among these is reduced muzzle flash.

NIGHT FIGHTS

Defensive and tactical encounters frequently occur in conditions of reduced light. When we use ammunition that produces significant muzzle flash, we can potentially hinder our own dark-adapted vision. More important, in many scenarios, muzzle flash can give away our position. This is likely less of an issue for civilian defenders than for military or perhaps police shooters, but then again, this is 2020.

Staying concealed in the shadows as you escape from the mob might be a lifesaving tactic. In a stunning example of relatively honest journalism, *The New York Times* published a detailed (though incomplete) breakdown of the events in Kenosha, Wisconsin, where 17-year-old Kyle Rittenhouse





Muzzle flash can work against you, and in your opponent's favor. Reduced-flash loads are shown in the gray-sky photos above.

used deadly force in justifiable self-defense against multiple criminal attackers. Immediately prior to the first shot fired by Rittenhouse is audio of a gunshot in his vicinity. The muzzle flash from this shot is clearly visible in the video footage, and provides confirmation of the location and timing of that shot. In any event, shooting reduced-flash loads is a tactical consideration.

With carbines, we can mitigate muzzle flash

fairly easily by using muzzle devices specifically designed to perform this function. With some combination of slits, prongs and grooves, flash suppressors do this job well.

Compared to a bare muzzle—where the entirety of the flash is expelled from the muzzle in one big ball of flame—flash suppressors divide the flash into smaller portions that are then diverted in different directions. This allows the

flame to disperse and disappear much more quickly, resulting in a reduction in the visible flash that ranges from noticeable to nearly complete, depending on the particular design of the flash suppressor.

The ubiquitous A2 compensator found on the overwhelming majority of U.S. military and descendant commercial carbines is an example of a flash suppressor that provides a noticeable reduction in flash. Yankee Hill Machine's Phantom flash suppressor is well known for providing nearly complete elimination of flash on many rifles.

Even better than a flash suppressor is a sound suppressor (aka silencer). Most modern suppressors reduce muzzle flash as a convenient side benefit to their sound

suppression function. Generally speaking, we don't have the same ability to install a flash suppressor or sound suppressor on a pistol that spends most of its time in a holster, compared to a carbine that is carried or slung. Here's where ammunition loaded with reduced-flash powder becomes critical. By choosing from the commercially available powders designed to produce reduced flash signatures, we can enjoy more discreet performance compared to our hand-loaded tactical clones.

FIRST SHOTS

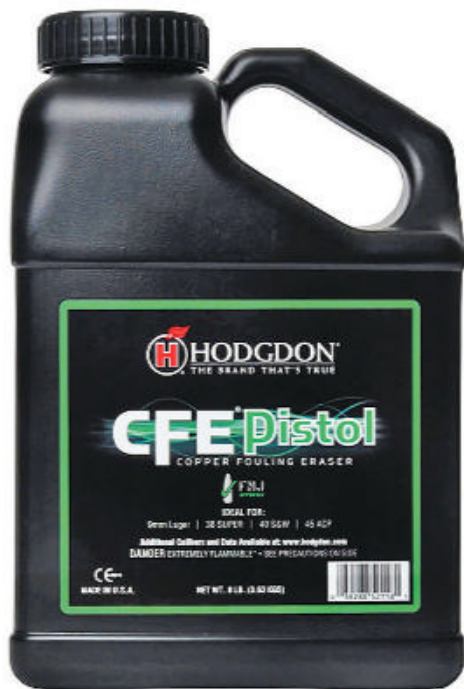
To set a baseline, I fired some off-the-shelf practice ammo loaded with full metal jacket (FMJ) projectiles in twilight conditions. Most of us shoot this inexpensive FMJ ammo for training and practice—budgetary constraints preclude using more expensive defensive ammo.

As such, there is limited expense involved in loading these cartridges with reduced-flash powder. The fireball generated by this FMJ practice ammo from a 5-inch 1911 pistol chambered in .45 ACP was impressive, to say the least. It proved quite difficult to get good still images of the fireball from this ammo



Federal's HST is one of the best defensive handgun projectiles available today.

Straight 8 Photo



DEFENSIVE AND TACTICAL ENCOUNTERS FREQUENTLY OCCUR IN CONDITIONS OF REDUCED LIGHT.”

even using a relatively fast single-lens reflex (SLR) camera shooting 7 frames per second (fps).

Switching to video mode at 60 fps allowed me to select the exact frame showing the peak of the flash from each shot. In addition, streaks of burning powder and residue can be seen leaving the muzzle. These images reveal a tremendous flash, but consider that they were captured in evening light and not complete darkness. Also consider the appearance of this flash if your opponent is wearing night-vision equipment. What is a significant target indicator in evening light with the naked eye (or camera) would be a veritable beacon in full darkness with night-vision equipment.

COMPONENTS ROUNDUP

Since 2020 is a dumpster fire, and uncertainty is the rule of the day given the politicized pandemic, economic chaos, civil unrest, etc., Americans have responded appropriately by purchasing every gun, box of ammunition, centerfire primer

and bottle of smokeless powder manufacturers can dream of producing. As a result, my load development for this article was limited to the components I already had on hand. Fortunately, Alliant's BE-86 and Hodgdon's CFE Pistol are exactly the powders I would have chosen for both 9mm and .45 ACP flash-suppressed loads. Another example of pistol powder listed as having reduced-flash properties is Shooters World Auto Pistol. Unfortunately, I wasn't able to procure Auto Pistol at this time.

Federal's HST projectile is arguably the best defensive pistol bullet available today. With extremely consistent expansion and penetration, plus admirable performance through most barrier materials, the HST is hard to beat. Prior to the current chaos, I purchased several hundred HST projectiles online. These bullets

had been pulled from loaded ammo, but were in perfectly usable condition for training, practice, hunting and other secondary tasks. Overall length was determined by measuring factory-loaded Federal HST ammunition.

Cartridge cases were chosen from stock on hand and consisted of three-times-fired Remington cases for .45 ACP and once-fired Federal cases for 9mm. I used Winchester Small Pistol Primers for 9mm and Winchester Large Pistol Primers for .45 ACP. I kept powder charges under maximum by starting low and increasing charge weight until reliability, point of impact and recoil impulse closely resembled factory loads. Loading 6.6 grains of Alliant BE-86 created a replica of the factory Federal 230-grain HST load. The flash from this charge was noticeably less than that of the baseline practice FMJ ammunition. Hodgdon's CFE

223 loaded at 6.8 grains (Hodgdon's stated maximum charge) provided similarly excellent performance.

THE UPSHOT

From the 4.5-inch barrel of a Glock model 17, the 147-grain HST over 4.8 grains of BE 86 performs like the factory load, with a small flash signature. Overall length with the 147-grain HST was set to mirror the factory-loaded ammo I measured at 1.19 inches. Loading the 147-grain HST over CFE Pistol gave good results at 4.2 grains.

If you like to clone tactical ammo at home for training, practice, zeroing, function checks, hunting, backup or supplemental defensive ammo or any other purpose, keep in mind that velocity and accuracy aren't the only factors to consider. Selecting your powder to minimize flash signature can be an important step in creating high-performance tactical ammo. Even in crazy times like these, we're blessed with a handloading marketplace that gives us several great options. **T**

→ Every profession and industry has its own specific language. From acronyms that get pronounced like words to phrases you'd never hear anywhere else, they've all got a form of communication that only those who are "in-the-know" will understand. The firearms industry is no different.

Even if you're brand new to this industry and its specific lingo, it's highly likely that you've encountered one, two or even all three of these terms: muzzle brake, compensator and flash suppressor.

If you're a seasoned industry professional, then you've definitely heard the

terms before. Undoubtedly, you know what they mean and how they differ from one another.

For the newcomers: This piece will teach you about the three terms and their different purposes. For the industry veterans: It's OK to read this article. I won't tell anyone you're brushing up on your knowledge base.

MUZZLE BRAKES

In the simplest of explanations, a muzzle brake reduces felt recoil. There is, however, more to it than that.

Energy from the ignition of your cartridge has to go somewhere. (Remember that Newton fella and his laws?)

That means just as energy from the escaping gas is propelling your projectile forward, it's also propelling your firearm rearward, creating what is known as recoil.

In order to reduce recoil, the escaping gas must be redirected, which is what a muzzle brake does. In some cases, the gas is redirected through a series of vents that are perpendicular to the barrel at 90-degree angles. In simpler terms, it means that the gas comes out the top or bottom of the brake instead of the muzzle end of the barrel. This redirection allows for less gas (and energy) to be pushed back onto the shooter. Other vents are designed to send some of the gas back at a 45-degree angle to the shooter, which pulls the gun forward.

Muzzle brakes can have either of these kinds of vents, or both. Basically, the goal is to send the gas in any direction other than forward. This especially comes in handy when you're shooting a large-caliber rifle. The bigger the caliber, the more the energy. That

extra energy translates into more recoil, which makes those large calibers less fun to shoot the more you do it, unless you've got a good muzzle brake.

Brakes do, however, have a couple downsides to them. First of all, they do nothing for sound. In fact, because the gases are in some cases directed back at the shooter, they can actually increase the volume of the shot.

The other downside is safety related. A muzzle brake is not trying to disrupt the flow of the gas in any way; it's only trying to reroute the gas in an effective method to reduce the recoil. As a result, the gas is still moving at an incredibly high rate of speed when it leaves the brake, making it dangerous to be next to when a shot is fired. Even with smaller calibers, the concept of combustion is still the same. Hot gases can burn, regardless of caliber.

THE ENDS
 CLARIFYING THE DETAILS OF MUZZLE BRAKES, COMPENSATORS AND FLASH SUPPRESSORS
 BY T. LOGAN METESH



Photo Courtesy Wilson Combat

COMPENSATORS

As the name implies, a compensator is making up for something—but what? Again, we go back to Newton. All of that energy has to go somewhere when the powder charge is ignited. That rapidly expanding and accelerating gas tends to cause the muzzle to rise when the gas is escaping the barrel. This isn't a good thing because it pulls your firearm off target, which in turn slows down follow-up shots.

Holes and/or vents in the device point in certain directions to counteract muzzle rise. A compensator can be easily visibly distinguished from a muzzle brake or a flash suppressor by looking at where the holes or vents are not located: on the bottom.

Holes on the bottom would cause the expelled gas to push the barrel up, which is the exact opposite of what we're trying to accomplish with a compensator. Instead, with holes on the sides and especially on the top, the gas pushes down on the barrel, helping to keep the shooter on target.

The escaping gases aren't causing the firearm to rise up a tremendous amount, but that's not the point. Any amount of rise translates into more time spent reacquiring the target before another successful shot can be made. Even though it might only translate into a second or so of added time, that can make a big difference in the long run. Just ask any competitive shooter who missed the first-place time by only one second.

Compensators might help keep you on target, but that is of little benefit in a low- or

MUZZLE BRAKE:

Redirects gas to the rear or to the side to reduce felt recoil. Gas directed on an angle to the rear helps pull the gun forward instead of letting it be pushed backward. Brakes tend to increase noise because gases are directed to the side at 90-degree angles and the rear at 45-degree angles, which also makes it dangerous to stand next to one when firing because it puts you in the direct path of the gas. (WC Rapid-Thread Muzzle Brake shown)

COMPENSATOR:

The escaping gas from a fired projectile tends to push the muzzle up. A compensator counteracts the rise by redirecting gas up or to the sides. This device will never have holes on the bottom, because it would be counterproductive to direct gas in a direction that would assist muzzle rise. Not recommended for use in low- or no-light scenarios because the flash is right in the shooter's field of vision. (WC Q-Comp shown)

Photos Courtesy Wilson Combat

COMPENSATORS MAY HELP KEEP YOU ON TARGET, BUT THAT IS OF LITTLE BENEFIT IN A LOW- OR NO-LIGHT SITUATION.”

FLASH SUPPRESSOR: Visually disrupts the flash of hot gas by introducing the surrounding cooler air at all different angles. This causes the gas to dissipate more quickly and in a variety of directions, which helps conceal the location of a shooter in low- or no-light situations. The device offers no advantage under infrared light or in broad daylight. (WC Accu-Tac FH shown)

Knowing which type of muzzle device best suits your style of shooting can enable you to choose the one that optimally helps handle the excess gasses from firing a gun.

no-light situation. Because the gases are directed out the top of the barrel, it directs a large flash of light right into the shooter's field of vision. If that large flash occurs while the shooter's pupils are dilated due to lack of light, then the shooter will be rendered night blind for a brief period of time, making follow-up shots extremely difficult. In that scenario, it doesn't matter how fast you're theoretically able to reacquire the target if you can't see it to begin with.

FLASH SUPPRESSORS

Flash suppressors do exactly what their name says they do. They suppress the flash, but there's more to it than that. First off, what is the flash? Well, the flash is the visible result of the hot gases created by the ignition of the gunpowder in your cartridge. Those gases drive the pro-

jectile out of the barrel and follow suit right behind it.

There's no way to get rid of the flash completely, but it can be hidden well enough to help keep the shooter's position concealed. Another benefit of the flash suppressor is that it helps preserve the shooter's vision in low- and no-light scenarios. If a shooter's eyes are exposed to the full intensity of the escaping gas, the pupils will respond by contracting to reduce the amount of light let in. Unfortunately, this change is not undone in an instant. Instead, it puts the shooter at a vulnerable disadvantage while his or her eyes are readjusting to the darkness.

The flash suppressor introduces cooler, ambient air to the considerably hotter expended gas. The air is introduced through a variety of slots or holes in the flash suppressor. This allows the cooler air to impact the hot gas from a variety of different directions. Doing so disrupts the path of the gas and makes it dissipate faster, thereby hiding the flash.

Even though a flash suppressor can do a great job of disrupting the hot gases, it does have limitations. For example, it only works for the naked eye by reducing the flash visibility on the visible spectrum of light. Muzzle flash viewed through the infrared spectrum will always be present because it's picking up an entirely different kind of light that cannot be deterred by redirection.

This relates to another drawback. Flash suppressors also only work in low- or no-light situations. A flash suppressor provides no visible disruption of flash in regular daylight. **T**

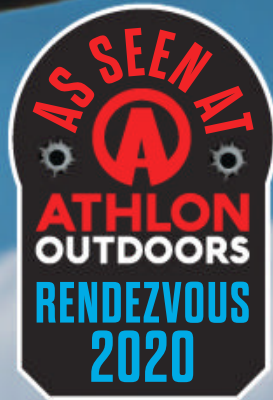


Andy Grossman Photo



SUPPRESSORS





THE KING OF

CANS

A FRESH LOOK AT WHAT'S NEW AND NOTEWORTHY AT SILENCERCO

[BY JAY LANGSTEN • SEAN UTLEY PHOTOS]

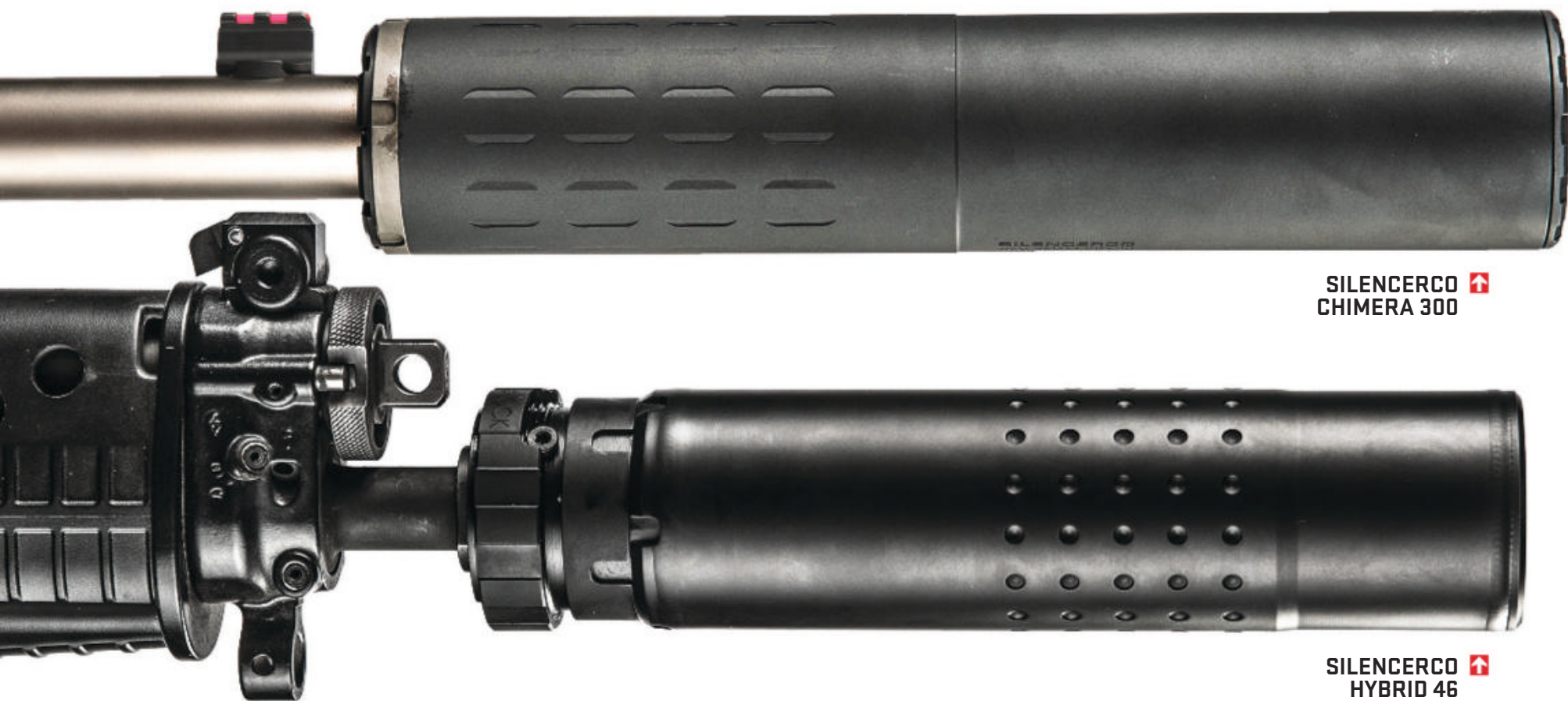


The annual Athlon Outdoors Rendezvous, held last September in Idaho, presented an opportunity to thoroughly check out some of the latest and greatest guns, bullets, optics and more. By the time it was all over, I had a coating of rich, black Idaho dirt blasted into and onto every nook and cranny of my carcass. And it was a pretty good test medium to see how well new equipment slated to launch in 2021 would perform after a thorough sand-blasting. Among the equipment items “tested” were a few of SilencerCo’s new “do-all” suppressors.

CAN BUYING TODAY

The popularity of suppressor ownership has grown tremendously over the past decade. A reputable expert in the silencer industry told me 10 years ago that the number of suppressors made and sold the previous year or two was greater than all of the cans that were licensed to private individuals since the National Firearms Act was passed. Give that a moment to sink in. From about 2008 to 2010, more silencers were transferred to private ownership than had been approved by the BATFE in the previous 70-plus years combined.

Paying for a suppressor—wading through the bureaucratic BS for a muffler and shelling out hard-earned money for a \$200 tax stamp for the privilege—isn't to be taken lightly. The Great Depression-era legislation was enacted at a time when requiring a \$200 tax was engineered by legislators to be such an enormous fee that it would essentially prohibit private citizens from buying them. Inflation has become the friend of those wanting to own a suppressor. It is the best of times, so to speak.



SILENCERCO 
CHIMERA 300

SILENCERCO 
HYBRID 46

To make ownership more affordable, the current trend in suppressor development is to make cans that bridge the gaps between calibers and host weapons. Aside from internal baffle design, a suppressor does its job best when the exit hole is just a few thousandths of an inch larger than the projectile. That's been addressed.

On the other end of the suppressor, other variables need to be present, depending on the host firearm. If you want to shoot a semi-auto pistol, a booster must be present for it to function correctly. If you want to shoot dirty ammo—such as .22 LR or pistol handloads shooting lead bullets and Unique powder—you need to find a can that is “user-serviceable.” That means the silencer can be disassembled and cleaned thoroughly after a day at the range. SilencerCo addresses these needs and gives prospective buyers multiple choices.

CHIMERA 300

A hint about the Chimera's capabilities is its moniker, which, in genetic terms, is a single organism composed of cells with more than one distinct genotype. It's not a true “do-all” suppressor, but it is pretty close. The Chimera is at home on the relatively diminutive .22 Hornet, all the

“THE POPULARITY OF SILENCER OWNERSHIP HAS GROWN TREMENDOUSLY OVER THE PAST DECADE.”

way up to .300 Winchester Magnum.

Suppressor popularity has increased to the point where it's now legal for the average Joe to own and use a suppressor in 42 states. Not far behind, 40 states now allow suppressors for hunting, too. That's where I came into the suppressor game in 2005, after I moved back to Tennessee from one of those states that put undue burdens on gun ownership.

If I'm squirrel hunting, I have a can on my rifle. Shooting subsonic ammo, it's a real advantage. When it comes to hunting big game, that's where shooting suppressed really shines. Suppressors help tame recoil, and I can trip the trigger without worrying about damaging my hearing. Using a versatile can like the Chimera and swapping back and forth between different host rifles is an advantage, too.

Rated for full-auto work, the Chimera's 20.7 ounces pack some pretty tough hardware. A stainless steel tube houses internals made from Cobalt 6, a Stellite blast baffle and Inconel baffles to absorb tough use.

It ships with a Charlie Direct Thread mount and a 5/8x24 TPI ASR muzzle brake, but can be used with other ASR brakes with different thread patterns. It also ships with a .30-caliber end cap, but other end cap diameters can be purchased to configure it to smaller calibers. “It's the end cap that makes all the difference in the level of suppression,” said SilencerCo's Dewie Vieira.

The level of suppression with various calibers starts at 125.8 decibels (dB) for a 300 BLK, and 5.56 NATO gets a little louder at 135.3 dB. When you step up to a .308 Winchester, the Chimera has been tested to limit muzzle blast to 136.8 dB, and stepping up to its maximum rating for a .300 Winchester Magnum trips the meter at 141.6 dB.

The Chimera is an all-welded can with a 1.6-inch diameter. It is pretty compact measuring 6.88 inches at its longest configuration. SilencerCo touts this suppressor as having “no barrel restrictions,” which means that short-barreled rifles are no problem. It can handle the pressure, literally. You've got your choice of colors, too, since it's offered in



↓ SILENCERCO SCO15 LOWER RECEIVER

basic black, white and flat dark earth (FDE). The Chimera also ships with a spanner wrench and a Charlie Multi-tool. MSRP is \$1,130.

SILENCERCO HYBRID 46

The Hybrid 46 goes even further than the previously discussed SilencerCo can, not only by being multi-caliber but because it's rated for pistols, too. The Hybrid 46 is built from stainless steel and titanium, which cuts weight and adds durability.

The Hybrid 46 adapts to a wide variety of host firearms by either direct-thread or quick-detach (QD) mounts. It measures 7.8 inches in length, has a diameter of 1.57 inches and weighs 17.3 ounces.

The Hybrid 46 can handle host handguns from 9mm to .45 ACP, and host rifles from 5.56mm NATO to .45-70 Government. This includes some new favorites like the .458 SOCOM, and the suppressor is full-auto rated. The Hybrid 46 is rated down



to 16-inch barrels for .45-70 Government, and down to an 18-inch barrel for all Magnum calibers up to .338 Lapua Magnum.

According to SilencerCo testing, the Hybrid 46 will tame a 9mm down to 125.7 dB, and a .45 ACP a smidge louder at 130.8 dB. A 5.56 NATO puts the needle at 130.4 dB. The big-bore .45-70 Government is rated at 140.6 dB, and the 300 BLK subsonic is a diminutive 123.7 dB.

The base Hybrid 46 retails for \$999. Mounts are sold separately. You've got a choice of colors for this can: Sniper Grey, black, white or FDE. It ships with two spanner wrenches and a Bravo Multi-tool.

SILENCERCO OMEGA 36M

The Omega 36M is a two-piece modular design with a fully welded core, front and rear. The rear core contains Cobalt 6 and Inconel baffles, which provide extreme wear

resistance under high heat and heavy fire. The front core consists of a new lightweight 17-4 baffle design to save weight while still providing high wear resistance. The titanium outer tube with lock-ring prevents tube loosening and reduces weight. The 36M is finished with a black Cerakote for a heightened level of durability.

The Omega 36M is rated down to 10-inch barrels for .223 Remington/5.56mm NATO; 16-inch barrels for .308 Winchester/7.62mm NATO and 20-inch barrels for .300 Win Mag and .338 Lapua Mag.

SCO15 LOWER RECEIVER

And believe it or not, there's more to SilencerCo's story! After covering some of the latest and greatest from SilencerCo's bread and butter, let's take a little detour to another interesting new product that diverges from their norm. The largest silencer manufacturer has ventured down the path to build other firearms that don't feature a metal tube with a hole in the middle of it. Now they are planting their flag, so to speak, in the huge AR marketplace, and getting started by offering a billet lower receiver.

The SCO15, SilencerCo's AR-15 lower receiver, is made from billet 7075-T6 aluminum. It is precision machined for compatibility to use a home builder's preferred parts. The lower receiver is finished in a Type III hardcoat anodizing for added durability and corrosion resistance.

The new design includes a proprietary ambidextrous bolt catch, integrated enlarged triggerguard, and ambidextrous multi-position sling swivels, as well as various other features. With the SilencerCo billet AR-15 receiver, you get the materials, finish and features you want and need to complete your dream AR-15 build.

Over the years, I've acquired several suppressors. Among them are three SilencerCo cans that are stellar performers. I'm getting ready to go through the hurry-up-and-wait process again to acquire one of these three cans. Can you guess which one?

For additional information, visit silencerco.com. 🛠️



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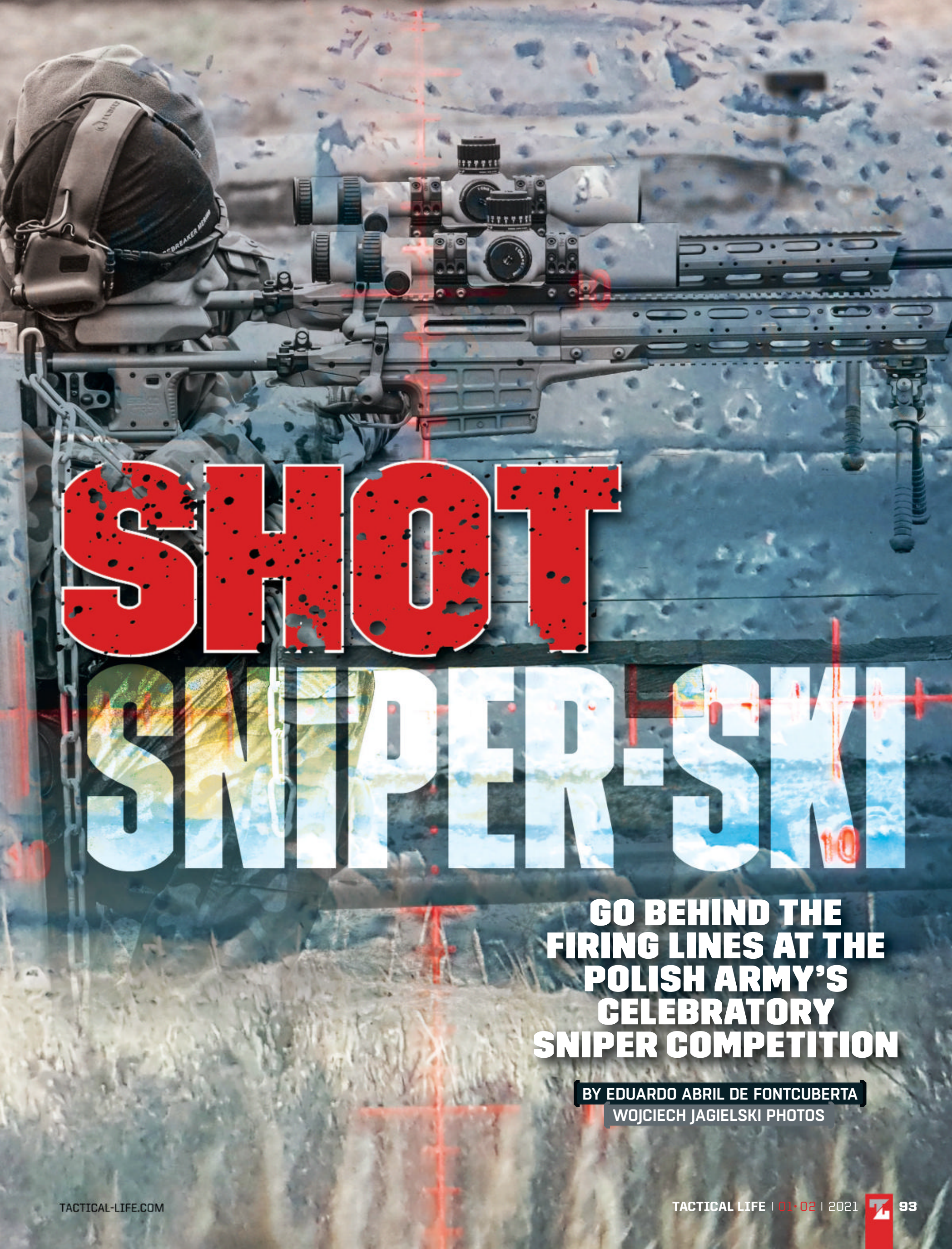


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SHOT

SNIPER-SKI

**GO BEHIND THE
FIRING LINES AT THE
POLISH ARMY'S
CELEBRATORY
SNIPER COMPETITION**

**BY EDUARDO ABRIL DE FONTCUBERTA
WOJCIECH JAGIELSKI PHOTOS**

SingleShot 2018 was a military sniper competition organized by the Polish Army at the CSWL *Drawsko Pomorskie* Polish Army Infantry Training Center, one of the best ranges in Europe. The 2018 edition was a very special event, as it commemorated 100 years of Polish independence. For the Polish military, it was a challenge to make this year a demanding competition, with complex stages based more in sniper teamwork than in extreme long-range shooting. The idea of this competition was born in 2015 after a military seminar for Polish Army snipers. Contrary to what most typical shooting competitions offer, the Polish competition is focused on actual sniper operations, which are far more complex than just shooting targets.

After two years, SingleShot was

opened for a few approved civilian competitors and ex-military sniper teams.

SNIPER SEMINAR

The competition was preceded by a sniper seminar, open only to active military teams due to the classified nature of the topics to be covered. A cadre of Polish and international instructors were invited to share their knowledge with the attending sniper teams. I was honored to be one of the guest instructors and to take care of the long-range shooting part of the seminar.

Some of the topics covered were: extreme long-range sniping with modern Magnums such as the .338 Lapua Magnum; the tactics of sniper actions in pairs and threes; snipers' tasks in asymmetric conflicts and the changes in snipers' and sharpshooters' tactics; methodology of training for each level of full-time sharpshooters and sniper; and self-training of shooters with the use of modern training methods and advanced ballistics for the .338 Lapua Magnum as the new standard sniper caliber in the Polish Army.

This seminar was presented by a

group of instructors including myself, Instructor T., retired veteran, sniper and trainer in one of Poland's SOF units, Maj. (ret.) Wojciech Jagielski, creator of the Polish Sniper School and Prof. Lt. of Navy (ret.) Lucjan Gucma, from the Maritime University of Szczecin, a renowned ballistics expert.

The seminar was the perfect prelude to the competition, as it exposed the sniper teams to some new techniques and reinforced their knowledge of some concepts that they would need at the competition.

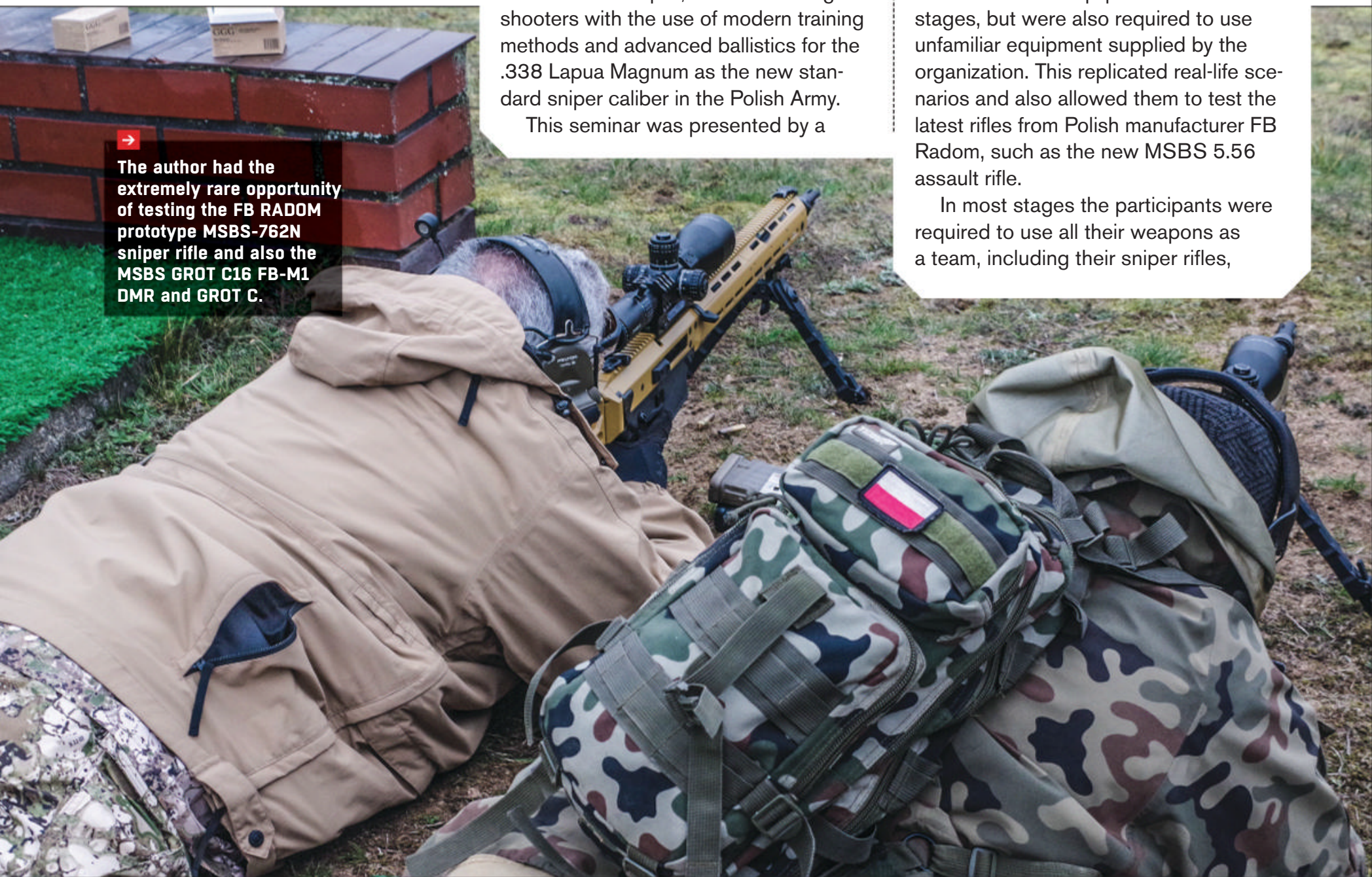
COMPETITION RATIONALE

On a cold November day, six sniping stages were run. Three were daylight stages and three were run at night.

Forty-four teams—31 active military sniper teams and 13 civilian teams—took part in the competition. Teams had to use their own equipment on most stages, but were also required to use unfamiliar equipment supplied by the organization. This replicated real-life scenarios and also allowed them to test the latest rifles from Polish manufacturer FB Radom, such as the new MSBS 5.56 assault rifle.

In most stages the participants were required to use all their weapons as a team, including their sniper rifles,

→ The author had the extremely rare opportunity of testing the FB RADOM prototype MSBS-762N sniper rifle and also the MSBS GROT C16 FB-M1 DMR and GROT C.





← The BOR 7.62x51 bullpup and ALEX 338LM rifles have been superseded by the SAKO M10 rifles—a much needed upgrade in the view of Polish snipers.



← In some stages, shooters had to fire the same RADOM MSBS rifles, simulating using a rifle other than their personal firearm.

“...THE POLISH COMPETITION IS FOCUSED ON ACTUAL SNIPER OPERATIONS, WHICH ARE FAR MORE COMPLEX THAN JUST SHOOTING TARGETS.”

semi-auto support rifles, pistols and sometimes also recovered equipment, depending on each stage's setup. All this included challenging movements and very cold weather.

Some of the stages, as commanding officer Lt. Remigiusz Łysik admits, were “...pretty easy...but only for well-trained, versatile soldiers.” The supreme challenge for competitors was gathering points while doing everything in proper sequence under the constraints of a stopwatch, and using all the different weaponry. I agree with this setup, since snipers have to be ready to adapt to many situations that might be out of their control, and still be deadly accurate.

I personally liked the lack of berms behind most targets, which pushed the competitors' first-round hit skills to the limit and sent out a clear statement. Snipers can't be and should not be trained to miss and correct, as many times the backstop won't give any feedback at all. They should be trained in the skills and ballistics knowledge to hit with the first round, be swift with

their calculations and be deadly. And, on those occasions when they do miss, they must have the tactical tools to find a solution and still hit the target on the follow-up shot.

Some stages were more technical than tactical, such as having to use night-vision gear on rifles to eliminate distant targets, or to use thermal-imaging scopes where ranges were shorter but more demanding in the time available to engage. It might seem easy, but only if you are perfectly trained. And in fact, no sniper team finished with a perfect score.

During one of the night stages, sniper teams had to locate their targets using only the light supplied by 40mm flares, which is complex, to say the least. Simultaneously, they had to use the flares to determine wind correction during the 30 seconds of light they provided. Only two flares were allowed per team. On that stage, I saw many frustrated faces among professionals who could not find their targets in time.

Daylight run stages assumed that the sniper team had to defend their position

with handguns and support rifles, and at the same time engage long-range targets precisely with their sniper rifles. For pistol and support rifle, mainly steel reactive targets were used, while snipers shot standard sniper military electronic targets at long range.

Once all stages were completed, I gathered opinions from soldiers and heard comments such as, “Could have been fairly easy, but the weather was rough,” and, “We weren't expecting that shooting a 400-meter target could be so demanding!” Another team said, “We thought this was a piece of cake, but when my observer confirmed the target location, the time was over.” Or, “NV made us too self-confident, so we got no hits with the flares.” The most common post-event report was, “Pistol was the most demanding.”

POLISH TACK DRIVERS

The Polish snipers have been equipped since 2017 with the well-known Sako M10 7.62x51 NATO sniper rifle and Hensoldt ZF 3.5-26x56 FF riflescope. Until recently, they all shot the Bor sniper rifle in 7.62x51 NATO and its .338 Lapua Magnum variant, called the Alex-338.

Some TL readers might not know that Poland has been a member of NATO



THE TOP SHOTS



GENERAL CLASSIFICATION OF SNIPER TEAMS (MILITARY):

1. 21st Independent Highland Brigade (PV1 B. Augustyn, PV1 J. Pelc)
2. 9th Reconnaissance Regiment (PV1 A. Bogdalski, PV1 M. Nowicki)
3. 6th Airborne Brigade (PV1 L. Baca, PFC L. Kempka)

GENERAL CLASSIFICATION OF SNIPER TEAMS (CIVILIANS):

1. PNL Team (R. Visser, J. Walczuk)
2. "Pure Evil" RWS/Helikon Team (J. Sidorowicz, M. Dudzik)
3. Gun Masters Team (P. Antasik, P. Urbanski)

↑ At the FB RADOM booth there was an impressive display of the AK-type BERYL rifles and the new MSBS C16 FB-M1, GROT C, GROT B bullpup and MSBS762, too.



← The author loves AKs, and the BERYL 1918-2018 Polish Independence Collector Edition is the most beautiful AK he's seen—one he'd love to have in his safe.

since 1999. By early 2000, they recognized the need for an accurate sniper rifle to supersede the SVD, and the factory OBR ZM Tarnow, Ośrodek Badawczo-Rozwojowy Sprzetu Mechanicznego in the city of Tarnow, was tasked with designing it. The Bor is a bullpup bolt-action, magazine-fed sniper rifle. The barrel length is 26.8 inches, with an overall length of 40.9 inches. I saw most Bor rifles equipped with Schmidt & Bender 5-25x56 PMII, but also some with Leupold Mark 4 4.5-14x50.

What about performance? The teams saw the new Sako as a needed upgrade over the Bor and Alex-338. In general

they were very happy with the Sako M10, but several teams expressed that they had lost optical performance with the Hensoldt and preferred the PMII instead.

SEMI-AUTO SUPPORT

All shooters were required to shoot, in some stages, the same semi-auto sniper support rifles as part of the competition. It was a fine opportunity for them, and for me, to test the next generation of weapons from FB.

Fabryka Broni Łucznik, aka Radom, is a Polish Defense Industry enterprise in the city of Radom that took over arms production after separation from

the Eastern Bloc. They were set up to design new modernized rifles differing from those in the AK family.

The Beryl and Mini-Beryl AK-type rifles are well known, but at the competition all teams tested the new modular-design Grot, as they call it, or MSBS, in its international nomenclature. Used at the SingleShot as the unfamiliar rifles in some stages, the new WAT-FB MSBS 5.56 and 7.62 modular rifles were shot to exhaustion.

TAKEAWAYS

I have been in many sniper competitions, either as a participant or as an instructor, and this was a very dynamic and challenging one. I would have added some more distance on some shots and would have restricted the use of the unfamiliar support weapons a little more. But I fully understand that for the FB factory, it was a superb opportunity to display their new products.

For their hospitality, I want to thank CSWL commander Colonel Marek Gmurski, who runs one of the best ranges in Europe. I also want to thank the SingleShot Team: Lt. Remigiusz Łysik (army), Second Lt. Maciej Gućma (navy) and Chief Spc. Mariusz Jankowski, who was the rangemaster. They all did a great job, and their efforts made this fine competition a reality. Being a guest instructor at SingleShot 2018 was an honor and a great experience. 🇵🇱



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To fill the need for a highly dependable and effective specialized weapon, Sig Sauer, a leader in providing products for such needs, developed the Sig MPX SBR 9mm subgun. Being a law enforcement officer and having contractor experience in Iraq and Kosovo, I chose to review this compact semi-auto that can be held as a pistol or used as a shoulder-fired rifle. Because of the increased interest in suppressors, things were spiced up with a SIG WSRD suppressor. For testing, I chose the Sig MPX SBR 9mm semi-auto, gas piston subgun with the 8-inch barrel. I chose it over the 4.5-inch barrel since the longer barrel produces higher velocities.

SUBGUN USES

The little gun would make a great patrol weapon. As you know, the sidearm of an LEO is considered a secondary defense weapon. The patrol shotgun or rifle is considered the primary defense weapon. So the Sig MPX SBR in semi-auto 9mm would make a substantial primary patrol weapon. The compactness of the MPX SBR with the 8-inch barrel and collapsed stock would facilitate it being carried



SIG's MPX SBR 9mm subgun fitted with the SIG WSRD 9mm Pistol Suppressor and ROME03 1x25mm optic.





**SHORT
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SUBGUN

FOR A COMPACT AND SILENT PATROL WEAPON, SIG'S MPX SERIES SHINES

BY CLINT THOMPSON





SPEC BOX

SIG MPX SBR

CALIBER:	9mm
BARREL:	8 inches
OA LENGTH:	21.75 inches
WEIGHT:	5.5 pounds (empty)
STOCK:	PCB
SIGHTS:	None
ACTION:	Semi-auto
FINISH:	Hard-coat anodized
CAPACITY:	30+1
MSRP:	\$1,957



in a patrol unit up front between the two bucket seats. With all of the electronic equipment required for operation of a patrol unit, there is little space for a full-sized AR or shotgun along with a second officer or passenger. If called upon, an officer could exit his or her vehicle by using the driver's door as a shield and at the same time bring out the Sig MPX SBR to defend the position. And, in a gun battle where you could miss your intended target, the 9mm round would be less likely to travel the same distances a 5.56mm round would.

In those times when we are required to sweep buildings for possible suspects hiding in rooms or behind crates and boxes, the ability to hold the MPX SBR with one hand while opening a door is invaluable. If hostilities were to break out, this firearm has the capability to lay down some firepower to suppress hostile actions. In these types of close-range encounters, the 9mm is very capable of getting the job done. Further, premium duty ammo for this subgun would be easier on the departmental budget than the same type ammo in 5.56mm. Practice rounds would be even more budget friendly.

As far as police, Homeland Security and the military, the Sig MPX SBR in semi-auto 9mm with the Sig WSRD 9mm suppressor would be a great fit. Using subsonic 9mm ammo would give



specialized units a great advantage. The use of the suppressed MPX SBR for military police, military personal security details or similar special-duty units would also be advantageous. Keeping down the sound level of gunfire could only enhance communications between operators.

I have found getting in and out of a military HUMVEE in full battle-rattle with a full-sized M4 is a challenge. A shorter defense weapon like the MPX SBR would be advantageous for close-range combat. Another potential consumer of the Sig MPX SBR 9mm would be private contractors who specialize in overseas personal security details or convoy protection. I saw a considerable number of private contractors from several different countries working in Iraq. All were armed

with many different kinds of shoulder-fired weapons. I believe the little Sig would be preferable when traveling in up-armored civilian vehicles or professional armored vehicles. With a stock that collapses and folds, the MPX SBR makes a handy, deadly, small package. Adding the WSRD suppressor adds a little over 7 inches to the equation.

Private citizen use of the SIG MPX SBR 9mm subgun would be for personal protection and recreational shooting. Traveling with this firearm is very possible, but one should check the state laws governing such carry. Home defense with the Sig is what I would consider a good civilian use for this weapon. If you are an RV camper type, this subgun would work great. Camping





in lonely roadside parks and remote primitive public campgrounds calls for some type of firearm protection. Just keep in mind that even the 9mm will penetrate just about all RV walls, including those of your fellow camper next door. Make sure your shots are backed by something solid like the ground or a tree.

ON THE RANGE

Once the product arrived, due to the cold and windy weather in Oklahoma, Officer Chris Mhoon and I met at the Wilshire Gun indoor range in Oklahoma City. Mhoon is an expert in the use of subguns. The Wilshire range has a 100-yard indoor range, which is perfect for our testing purposes. General Manager Tyler Miller was very gracious and supportive. Being an American hero and current U.S. military member, Sgt. Miller was and is a wealth of information. He personally owns a SIG subgun. As a bonus, Wilshire Gun is a Sig Sauer dealer and has Sig armorers for support, which only enhanced our testing.

We commenced the testing by

→
Oklahoma LEO Chris Mhoon (top) fires the SIG MPX SBR 9mm. Five-shot group (right) of Sig 9mm 124-grain V-CROWN JHP at 35 yards. Multiple rounds (below) of the same Sig load fired at a distance of 50 yards.



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“WITH A STOCK THAT COLLAPSES AND FOLDS, THE MPX SBR MAKES A HANDY, DEADLY, SMALL PACKAGE.”

measuring the velocity of the Sig ammo provided. The ammo tested was 124-grain V-CROWN JHP and 115-grain FMJ. As expected, both types of ammo functioned flawlessly. After several mags of ammo were expended and the BRAVO4 optics mounted and zeroed in, we began the first test.

Three rounds of SIG 124-grain V-CROWN JHP averaged 1,312 feet per second (fps). Three rounds of the SIG 115-grain FMJ averaged 1,314 fps. When measuring velocity, I am not only looking for the muzzle velocity average but to see the variance of each round. The 124-grain V-CROWN JHP varied by only 8 fps. This is a good indication

of the ammunition’s quality in production. The 115-grain FMJ varied by 80 fps, which is still excellent.

Next, we tested the MPX SBR to see how well the ammo and firearm grouped. Since the Wilshire’s 101-yard range starts at 35 yards, our first test for five-shot groupings was moved back from the normal 25 yards to the 35-yard line. The next test distance was at the 50-yard line. We fired five rounds of the 124-grain V-CROWN JHP at a Splatter Burst Target 18x24-inch Triple silhouette splatter target. I love these targets because they are good quality and are very heavy duty. The five-shot average for the 124-grain HP was 1.5 inches.

The five-shot average for the 115-grain FMJ was 1.3 inches.

At the 50-yard line, the 124-grain HP scored a five-shot average of 1.8 inches, with the 115-grain FMJ scoring a five-shot average of 1.48 inches. To test these rounds at the 100-yard range would be counterproductive due to that fact that personal defense normally takes place within 25 yards or closer. Even law enforcement should consider the risks of firing at threats at 100 yards, as rounds missing their mark have to go somewhere. During the ammo grouping test, it was apparent that the BRAVO4 was a good match for this firearm, as it made this task much easier.



← The Sig WSRD suppressor for 9mm weighs in at only 9 ounces, is 7.2 inches in length and has a diameter of only 1.38 inches

SUPPRESSED

The MPX SBR with the 8-inch barrel weighs in at 5.6 pounds without the suppressor and about 6.3 pounds with suppressor. The overall length is 21.75 inches without the suppressor and 29 inches with the suppressor. The MPX SBR comes with one 30-round polymer magazine and a collapsible/folding stock.

Testing the decibel (dB) levels with suppressor at 20 feet distance ranged from 127 to 147dB indoors. Outdoors, the decibel level would be somewhat less. Bullets break the sound barrier at about 1,100 fps. Breaking the sound barrier causes a “cracking” sound as the bullet goes downrange. Using subsonic ammo would reduce the noise level further.

The MPX SBR was test fired for one hour using an indoor range controlled environment. Firing was done with periods of cooling while reloading magazines and recording data. However, temperatures recorded at the conclusion were 78 degrees F. at the breach



SIG BRAVO4 OPTICS

The BRAVO4 expands the shooter's field of view by 10 percent, 43 percent wider than standard 7-degree sights. This would be a 53-foot-wide field of view at 100 yards. This gives the combatant a much needed expanse when in a gunfight. The BRAVO4 has the patented MegaView aspherical lens eyepiece that provides 47 percent more eye relief. The LensArmor provides abrasion-resistant coatings that will withstand the harshest of conditions.

and 282 degrees F. at the suppressor. Suppressors can reach more than 450 degrees F. depending on volume and type of rounds fired. Generally speaking, you can figure +7 degrees per round. So firing 30 rounds of 9mm in the Sig MPX SBR would bring the temperature up 210 degrees.

I can say I loved the trigger pull of my test subgun. Sig says the trigger pull will vary from 5.5 to 9 pounds. The trigger pull on my test model was 8.7 pounds, but was crisp with very little drag. When I am carrying a duty weapon, whether handgun or shoulder-fired, I like to have a crisp, heavier trigger pull than on my hunting guns.

FINAL NOTES

I found I have great respect for the SIG MPX SBR 9mm subgun. I liked the AR-type handling and AR-type breakdown. My test model proved flawless while digesting several hundred rounds of ammunition. I like the feature of right-left hand shooter with dual-sided selector switch, magazine release, charging handle and bolt release. A full-length Picatinny rail gives the shooter a solid base for mounting optics and targeting lasers.

Sig's BRAVO4 was amazing with its clarity and field of view. It was easy to throw the subgun up to my shoulder and have a perfect view of the reticle. The ease of use and the adjustable horseshoe dot's brightness enhanced my shooting. Shooting rapid fire at 35 yards was made easy with the aid of the BRAVO4.

If you are a chief of police or sheriff who is looking for a compact, top-quality 9mm semi-auto subgun that you can bet your life on, then the SIG MPX SBR 9mm is for you. If you are a citizen who is looking for the ultimate defense weapon, then look no further. I would like to give a big shout to Sgt. Tyler Miller of Wilshire Gun for the over-the-top assistance for the testing of this firearm. (Editor's Note: The MPX SBR is no longer offered from Sig Sauer, please check secondary markets. The Sig MPX K [pistol variant with brace] is still offered from Sig Sauer.) For more information visit sigsauer.com



PERFORMANCE

LOAD	VELOCITY	ACCURACY
Sig Sauer Elite Performance 124 V-CROWN JHP	1,312	1.80
Sig Sauer Elite Performance 115 FMJ	1,314	1.48

Bullet weight measured in grains, velocity in fps by chronograph and accuracy in inches for best five-shot group at 50 yards.



LEADER OF THE



The Tactical Solutions X-Ring Takedown VR Rifle is what lesser .22 rifles aspire to be. Meticulously designed, perfectly proportioned and beautifully executed, the TacSol X-Ring VR takes the humble .22 to a whole new level. When first you heft this exquisite utility gun, you can tell it's something special.

BALLISTIC PHILOSOPHY

I thought plumbing was tough until I replaced the entrails of a toilet or three. Likewise, automotive maintenance seemed daunting until I installed my first fuel pump. Undertaking minor surgery is also not such a terrible chore once you know what you're doing. Most things in life are not intrinsically hard. To get good at something, however, you have to do it a lot.

The first time I saw a radiologist read a chest X-ray in 30 seconds, I was gobsmacked. I asked the guy how he could assimilate so much information in such a short time. He explained that the first 50,000 of them had been hard. And so it is with tactical shooting.

I have a pal who can drop rounds onto a 12-inch steel plate a kilometer distant all day long and make it look easy. This guy is a ballistic savant. However, there's more to it than just having the gun-nerd gene. That guy can shoot that well because he's launched an unholy

BACKPACKERS

TACSOL'S X-RING TAKEDOWN VR RIFLE EMBODIES PORTABLE PRECISION MARKSMANSHIP

[BY WILL DABBS, MD]





→ The oversized charging handle is easily reversible.

↑ The TacSol X-Ring Takedown Rifle breaks down into two easily packable portions in mere moments. The rifle retains its zero when reassembled and requires no tools for disassembly.

number of bullets getting there. The art of body position, cheek weld, breathing and trigger squeeze is the cumulative result of countless hours of practice.

If you are independently wealthy, you could just burn through a zillion rounds of match-grade 6.5 Creedmoor at more than a dollar a pop. However, most of us actually work for a living. The way to perfect your form and technique before you start throwing the expensive stuff downrange is to practice on something more cost effective. For most of the shooters in America, that trainer gun is a .22 rimfire rifle.

THE ORIGIN STORY

The .22 LR is technically described as the 5.6x15mm rimmed cartridge. This ubiquitous American staple has its origins in the 19th-century Flobert BB cap. A Frenchman named Louis Nicolas Flobert designed his eponymous rimfire cartridge in 1845. This tiny round propelled a small lead bullet via the force of the primer material alone and stoked gallery guns and plinking weapons around the globe. While his delightful little cartridge revolutionized the shooting world, I suspect Louis still had a tough time in grade school rocking a last name like Flobert, even in France.

Based in America, the J. Stevens Arms and Tool Company built the Flobert BB Cap into something truly useful in 1887. The company stuffed a 40-grain lead bullet into a rimfire case stoked with a little gunpowder and created the .22 Long Rifle, the most popular cartridge on the planet. American shooters burn more than 2 billion rounds per year.

The landscape is littered with .22-caliber rifles. Pumps, single shots and

lever actions aplenty clutter the shelves at your local gun emporium. However, nothing holds a candle to America's favorite, the Ruger 10/22.

The Ruger 10/22 has been in continuous production since 1964. Maneuverable, versatile, exciting and cheap, production numbers currently exceed 5 million. The gun's simple mechanism and modular design guarantee wide distribution and ample accessories.

The Ruger 10/22 is the Ford Mustang of the .22 rifle set. It's rugged, reliable and everywhere. However, Tactical Solutions of Boise, Idaho, produces a variation of the same action that's polished to a razor's edge. Every component of the TacSol X-Ring is refined to the very limits of human engineering. If the 10/22 is a Mustang, then the X-Ring is a Bugatti.

SPEC BOX

TACTICAL SOLUTIONS X-RING TAKEDOWN VR

CALIBER:	.22 LR
BARREL:	16.5 inches
OA LENGTH:	34.75 inches
WEIGHT:	3.7 pounds
STOCK:	Magpul X-22 Backpacker Takedown
SIGHTS:	Fiber-optic front, fully adjustable rear
ACTION:	Semi-automatic
FINISH:	Matte Black (optional SBX, Quicksand, Gunmetal Gray)
CAPACITY:	10+1
MSRP:	\$1,155

PERTINENT PARTICULARS

The X-Ring Takedown VR reflects the current state of the art. The 16-inch barrel is comprised of a chrome-moly steel bore nestled within a 6061-T6 aluminum sleeve. The aluminum bit has a fat contour yet is fluted for rigidity, light weight and cool points. The muzzle is threaded 1/2x28. The included thread protector is so perfectly executed that

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SUPPRESSORS



The X-Ring Takedown VR Rifle from Tactical Solutions is exquisitely well executed. Everything about this tidy little firearm is perfectly done.



it's tough to see where the barrel ends and the protector starts.

The 6061-T6 aluminum receiver is beautifully formed, and the charging handle is oversized for easy access. There are cutouts on both sides of the receiver so you can mount the charging handle on whatever side best suits your particular handedness. The stainless steel bolt rides on a pair of guide rods for buttery-smooth operation.

There is an extended magazine release that's hugely more functional than the Ruger original. Just give it a flick with the third finger on your shooting hand and the magazine drops right out. Fiber-optic sights make for rapid target acquisition. The rear sight adjusts for elevation with a small screwdriver.

The furniture is from Magpul, so it's the best that mankind can produce. The gun splits in half at the front of the receiver with minimal fuss. Just retract the bolt, push forward on the takedown lever, give the forearm a twist, and the gun breaks down into two pieces for stowage or transport. The front half snaps into a receptacle in the bottom of the buttstock to form a single compact unit.

The Magpul X-22 Backpacker stock has space for three spare 10-round magazines and is formed from a durable polymer material. There's a waterproof compartment in the pistol grip portion that's sealed with an O-ring and will

carry a little emergency last-ditch ammo or some M&Ms. The Magpul X-22 stock harmonizes with this rifle like I fit into my favorite pair of broken-in boxers.

The stock on my gun is black, and the metal is a durable steel color. The resulting spectral dissonance is cooler than Iron Man and tougher than the Terminator. I know we guys aren't supposed to go in for such esoterica as style and aesthetics, but you've got to admit that this gun looks sharp.

There is an integral 15-MOA scope base milled into the receiver assembly, and those dual recoil springs make the action smoother than an infant's butt. You can order the gun with a standard Ruger BX fire control group or a proprietary TacSol variant with an adjustable trigger overtravel. My gun has the standard BX group, and it shoots delightfully straight.

STOCK DETAILS

The Magpul X-22 Backpacker Takedown stock can be configured with either standard or optics-height cheek risers. Not that you need it with a .22 rifle, but there's a comfortable, soft rubber buttpad as well. The 60-degree ergonomic grip perfectly interfaces firearm with flesh. Standard sling sockets accept pushbutton QD swivels, and



The X-Ring Takedown VR Rifle breaks down into about nothing without tools. Once dismantled, it will ride in some remarkably compact places.



Bullet weight measured in grains, velocity in fps by chronograph and accuracy in inches for best four of five-shot groups at 25 yards.

PERFORMANCE		
LOAD	VELOCITY	ACCURACY
Winchester M22 40	1,018	0.5
CCI 32	1,539	0.9
Winchester 37	1,273	0.6

“THE TACSOL X-RING TAKEDOWN VR IS THE FINEST CONSUMER-GRADE .22 RIFLE I HAVE EVER SEEN...”

an inspired reversible barrel tray accommodates both heavy and pencil barrels.

All up, the X-Ring Takedown VR still weighs less than 5 pounds. Combine this with the brilliant Magpul stock and you have an enormously capable rifle that will break down and store in some of the most compact spaces. The stock comes in several colors and embodies that angular muscle-bound ambience that characterizes everything Magpul.



INCIDENTALS

Leupold is an industry-defining name in tactical optics. Its reputation is built upon decades of quality riflescopes and countless real-world hunting and tactical engagements. The Leupold VX-R 1.25-



4x20mm riflescope perfectly complements the exceptional capabilities of the X-Ring Takedown VR.

Screw the scope to 1.25X and run the gun fast with both eyes open. The illuminated Firedot reticle uses fiber-optic technology to provide a bright, fast CQB aiming dot. Punch a button and the dot comes on. The brightness control is incorporated within that same pushbutton. Spin the power ring up to 4X and you're set to reach out to the practical limits of the rifle and the cartridge.

Tactical Solutions also makes its own sound suppressors. Given its Lilliputian dimensions, the tiny little Aeris is supernaturally effective. The Aeris is formed from titanium and is a paltry 3 inches long. At 3 ounces total, you can thread this thing onto the muzzle of your X-Ring VR and forget it's there. Despite its small size, the Aeris performs almost as well as a larger, heavier can would.

PRACTICALITIES

The TacSol X-Ring Takedown VR is the finest consumer-grade .22 rifle I have ever seen, and that level of quality is hardly cheap. Combine that with some fairly spendy accessories and you can get into some decent coin. Now that you've crafted the finest rimfire rifle humanity can produce, what exactly might you do with it?

Properly accessorized, the X-Ring Takedown VR makes a peerless survival, utility or camp gun. The rifle breaks down to about nothing and shoots like a laser. It will also pack a total of 41 rounds onboard without a bunch of annoying stuff sticking out all over the place. What this top-end rifle is really great for, however, is helping you become a world-class marksman.

Dropping down behind the X-Ring Takedown VR lets you practice the fundamentals of breathing, form and trigger control without hocking the kids' inheritance to cover the ammo. And the skills you acquire running this delightful little rifle carry over nicely into larger, meaner, scarier iron.

The TacSol X-Ring Takedown VR moves fast and shoots straight. It would handily fill the cooking pot with bunnies or tree rats and liberally ventilate any surplus beverage cans you might have lying about. Should the threat walk on two legs instead of four, it would keep you nice and prickly as well. Slick, refined, efficient and cool, the X-Ring Takedown VR is truly rarefied iron. For more information, visit tacticalsol.com.



THE DARK IN LIVING COLOR



Traditional analog night-vision gear has been used since the WWII. We are in the third generation of intensifier tubes, but not a lot has changed since the 1990s. However, digital technology is evolving at an exponential rate. There is an elusive goal for true digital night-vision mastery, and SiOnyx has nearly achieved it with their SiOnyx Aurora Night-Vision Camera.

WHAT IS DIGITAL NIGHT VISION?

Digital cameras, like your smartphone, and security cameras such as Ring and Nest, use sensors to receive light. The camera sensor can actually see infrared (IR) light, and manufacturers typically use an IR-blocking filter so the camera can take a photo without having IR light ruin the image. Digital single lens reflex

HERE'S THE REAL SCOOP ON SIONYX'S AURORA DIGITAL NIGHT-VISION CAMERA

[BY NICHOLAS CHEN]

(DSLR) cameras have these types of filters, commonly called hot mirrors. Artistic photographers will remove this hot mirror to take photos of objects using IR light. Security cameras like Ring do not have this filter, so at night it has IR lights to illuminate the dark.

The problem with digital night vision is that while they can see IR light, they are the equivalent of first-gen night vision. You need to use IR illuminators to see in the dark. Yes, you could take a long exposure photo with a good camera, but that takes time and you cannot move the camera otherwise the image will be blurry.

Well, there have been some leaps in digital camera technology. One step toward seeing in the dark is extremely high sensitivity to light. This was standardized in film cameras and has carried over to digital cameras. The Sony A7S camera, for



← This is what the Aurora captures when there is no ambient light. This was in the desert with 100-percent cloud cover shooting 9mm tracers out of a Zenith Z-5RS MP5.



example, has such a high light sensitivity that it can film and photograph at night and the resulting image looks like it was taken in the daytime. However, this camera is not cheap. They go for over \$2,000, and you need to spend another \$400 to remove the hot mirror if you want the Sony to see IR light.

AURORA DETAILS

One thing that sets the Aurora apart from other highly sensitive digital cameras—besides the fact that it can see IR light—is the price. The Aurora retails for only \$800, but what really makes it amazing is its ability to see the near-infrared (NIR) spectrum.

The Aurora camera is like a small camcorder in form, but rather than a folding LCD screen it has an electronic viewfinder (EVF), so for viewing you hold it up to your eye like a pocket scope or a rangefinder.

The camera has a selector ring just behind the focus that selects among day, twilight and night modes.

Day mode is self-explanatory. Twilight mode is for increased light sensitivity during dusk and dawn. Then when night has fallen, you switch the camera to night mode, and the sensitivity is kicked up to 11 with the added benefit of seeing IR light. It amplifies light and turns night into day.

Just like a PVS-14, the Aurora can see IR illuminators and IR lasers. Since the Aurora is a digital camera, it sees and can film or photograph in full color. Yes, color night vision is possible with


the Aurora. While incandescent lights create light in the NIR spectrum, they will look purple in the Aurora camera. But LEDs and chemlights will show up in whatever colors they produce.

BUYERS BEWARE

While technology like the SiOnyx Aurora is capable of turning night into day, it still has some drawbacks. First of all, it is a digital camera, so there is a little bit of lag in the EVF. If you try wearing the Aurora on your helmet, for example, like a PVS-14, that lag is a little disorienting. While I was able to walk around and shoot with the Aurora, it was a bit annoying in this respect compared to using real night vision. I can drive a car at night with my PVS-14, but the Aurora's lag makes this far too dangerous.

Another issue with the Aurora is that the light sensitivity is not perfect. While it is certainly great, the Aurora needs a healthy amount of ambient light to display its best. Under a full moon, the image certainly looks amazing. But anything less than a full moon, and the Aurora sensor struggles. Kind of like your PVS-14 or similar night-vision device in extreme dark, when you only get static. Well, the Aurora is like that. The image suffers from a lot of digital noise if it is too dark. While you can compensate by throwing light down-range, it does not actually help much.

Have you ever used a digital camera and used it to look at something dark, then something brightly lit? What happened to the dark area? The Aurora

 The SiOnyx Aurora's main controls are easy to access and very intuitive. No need to be a rocket scientist or brain surgeon to operate the unit.



←
Amazingly, color night vision is possible with the Aurora, and you can also film or photograph in full color at night. Subjects illuminated by incandescent lights look purple in the Aurora.

“THERE IS A FEATURE THE AURORA HAS OVER GEN 3 NIGHT VISION, AND THIS IS ITS ABILITY TO SEE OUT OF BAND.”

has the same problem. If you are using it in the dark and it is trying to amplify the light, but then you turn on a bright weapon light, the camera changes its auto exposure. Everything outside of the beam pattern darkens and you can only see what is in the beam of light. That is not what typically happens with traditional night vision. You can still see what is outside the beam pattern for better situational awareness.

When you're looking through the EVF, the screen and image are rectangular. While the Aurora has a wider angle field of view (FOV), at 48 degrees compared to a regular PVS-14's 40-degree FOV, I felt like in this way I was seeing less with the Aurora.

OPS IN THE DARK

Like a handheld thermal device you can keep the Aurora in a pocket and pull it out whenever you want to see in the dark. Don't forget, it is a camera, so you can record video or take photos

whenever you want just by pressing the red button when you are in still or video mode. The resolution is not that high, but it is decent at 1080x720 dpi.

The bottom of the Aurora has a standard tripod screw hole, which allows you to mount the Aurora. The tripod screw hole is the same thread pitch as a PVS-14, however. A standard J-arm won't work well with the Aurora.

The screw hole is in line with the EVF, and you have to position the Aurora perfectly vertical since the EVF is a rectangle. While a J-arm can sort of work, it will be necessary rotate the camera at an odd angle to attach it securely, which won't be as useful in terms of taking photos or video with it.

I used a PVS-14 bridge and then later Lion's Gear Solutions sent me its Hyperion Mount. This bridge uses a Wilcox dovetail and helps in mounting two Auroras on your helmet. Just like dual-

tube night vision, running twin Auroras is better. You have better depth perception and can of course record simultaneously to create 3D stereoscopic video.

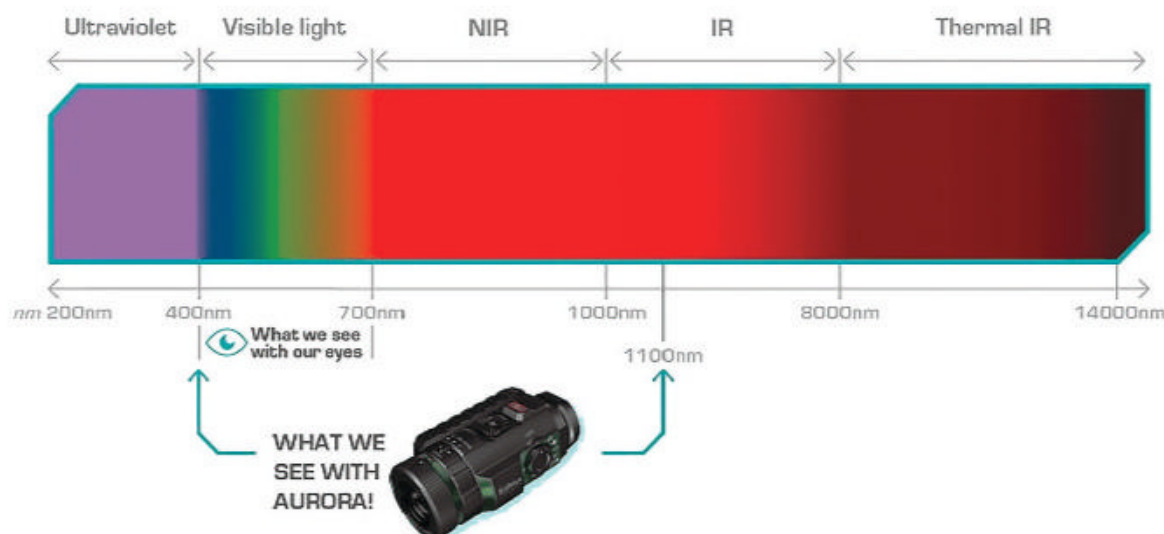
Right now there is only one weapon mount for the Aurora, which was made for SiOnyx. It works but leaves much to be desired. The mount is excessively long, but for good reason. Under recoil, the EVF can dislodge from the camera. So the mount prevents the latch for the EVF from moving under recoil. With the mount, you can attach an Aurora behind a red-dot and aim while looking through the Aurora. However, I would recommend doing this only with a gun with low recoil. Due to the design of the EVF, the eye relief is nonexistent. So if you do not want the Aurora to give you scope bite, I recommend wearing it on your helmet or holding it in your hand.

There is a feature the Aurora has over Gen 3 night vision, and this is its ability to see out of band. Regular night vision can see up to 940nm, but the Aurora can see up to 1064nm! I tested it with my friend's fiber laser, and the Aurora could certainly see the laser beam as it engraved a gun part. I tried looking with my PVS-14 and ANVIS-9 goggles, but they could not see the beam.

ROOM FOR IMPROVEMENT

The battery life of the Aurora is rather low, at just two hours of continuous use. However, you can get spare batteries off the interweb for cheap. It uses a Fujifilm-style

VISIBILITY SPECTRUM





NP-50 lithium ion battery. I got a two-pack of batteries with a USB charger for only \$14 and free shipping. Not bad. Plus the charger allows me to recharge the batteries without having to plug in the camera.

The Aurora is also in desperate need of a lens cover. It does come with a soft bag to store and protect it, but the lens is completely smooth. They should have made the lens more like a DSLR, so it can take screw-in filters to protect the lens. There are some DIY options. I repurposed a set of Nikon scope bikini covers that just happen to fit perfectly. My friend bought a Butler Creek flip cap for his Aurora. And Lion's Gear Solutions makes a 3D printed slip-on cover with laser-cut acrylic sacrificial lens.

The shape of the Aurora seems



↑ The controls for the shutter and onscreen display are on top of the Aurora, yielding easy access to the user without lots of searching.

unnecessary. The form factor mimics a small camcorder, but I would rather see the Aurora minimized. Relocate the battery and controls off the camera body via wired cable mounted on a helmet. Then you will have just the lens, CCD sensor and EVF in front of your face. Another option is to change the position of the components. Rather than have all the components lined up in a straight line, they could reorient the battery to be below or above the lens, thus shortening the overall length of the camera. Since the EVF is detachable, I would like to see an extension cable so the EVF could be removed from the camera. Then make a special set of frames to hold the EVF over my eye, but with the camera mounted to my gun.

FINAL THOUGHTS

The price of the Aurora makes it an affordable accessory for your night-vision shenanigans. You can often find them on sale for good prices. I got mine when they were on sale for \$599. You can use it to record yourself and your friends at the range at night.

There is one huge benefit that the Aurora has over traditional night vision. The Aurora is not ITAR controlled. Gen 3 night vision is strictly controlled by ITAR. Non-U.S. citizens are not allowed to look through Gen 3 night vision. You are not even allowed to travel out of the country with Gen 3 night vision. But the Aurora is not regulated. Throw it in your carry-on luggage and bring it on a plane when you go on vacation outside the U.S.

The Aurora is a very capable camera that can see in the dark. It gives us a glimpse into the future of digital night vision. While it has not replaced my traditional night-vision devices, like my PVS-14 and ANVIS-9 goggles, it does record video and photographs while being able to see IR light in the dark. Another huge benefit is the fact that the Aurora can see in full color. More light spectrum is more information, and there is nothing wrong with that. I look forward to how far digital night vision will progress in the coming years. They will probably be replacing traditional night vision before long, at the pace technology is evolving. For more info, visit sionyx.com.



↑ This is what the onscreen display looks like in the EVF. The Aurora unit literally amplifies light, making nighttime look like full daylight. And the best thing, it's actually quite affordable.



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BATTLE TECH

HOW CLOSE ARE WE TO AI WEAPONS TAKING OVER THE WORLD?

[BY PETER SUCIU]





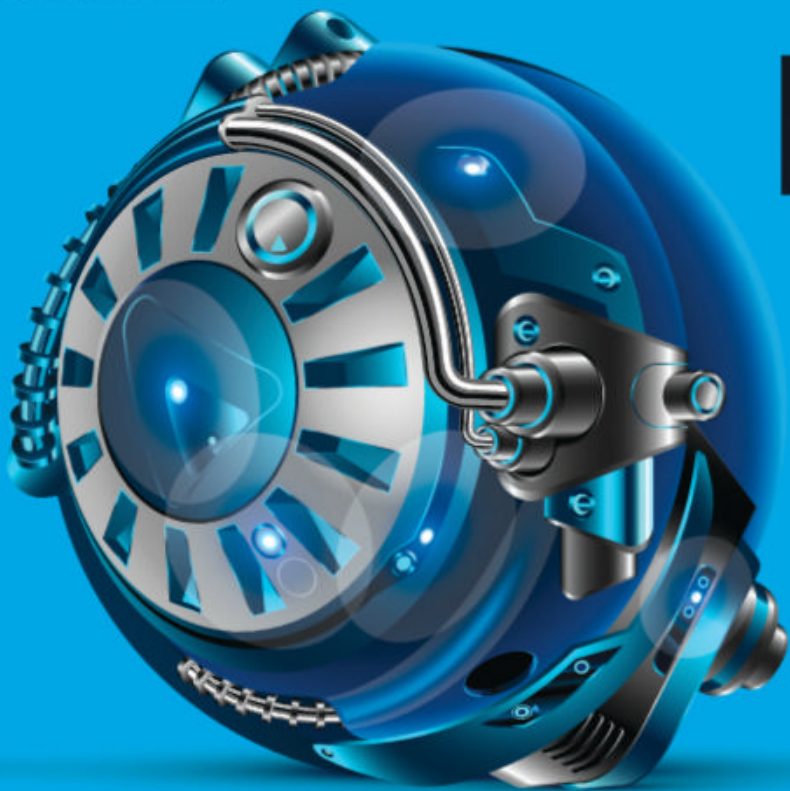
Works of science fiction have long depicted a dark and ominous future in which machines rule over their human creators.

Decades before *The Terminator* made Arnold Schwarzenegger an action movie megastar, the 1920 play *R.U.R. (Rossumovi Univerzální Roboti, or Rossum's Universal Robots)* was the first to introduce the concept of robots that rise up against their masters. In writer Karel Capek's story, the robots were made from synthetic organic matter and were designed to do menial tasks.

This theme was explored decades later in Philip K. Dick's *Do Androids Dream of Electric Sheep?* Dick's story was made into arguably the first true "cyberpunk" film, by director Ridley Scott, as *Blade Runner*, and while the replicants in the movie don't exactly become humanity's masters, it is clear that they could rise up and certainly cannot be trusted.

The Terminator and *The Matrix*—which according to one popular fan theory could actually be set in the same universe, with the former serving as a prequel—each featured a truly dystopian future where mankind has been all but exterminated and is then ruled by machines that have turned our planet into a living hell. Each series has spawned novels, comic books, video games and, of course, a legendary array of toys. But should they be taken seriously, as portents of what future these autonomous weapons present?

iStock Images





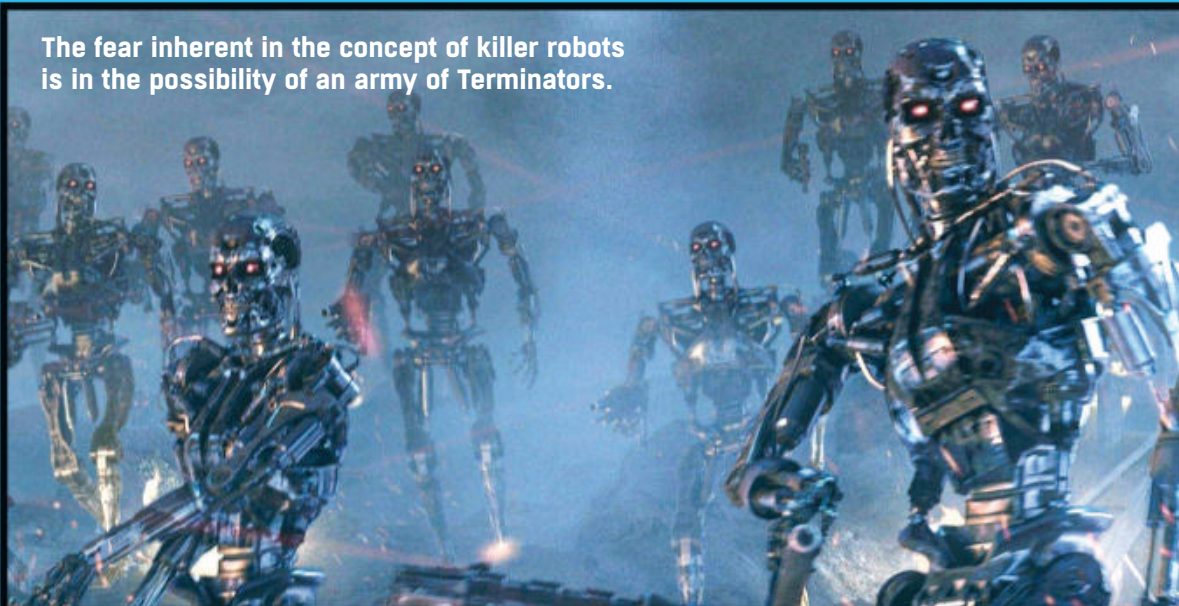
Director James Cameron's *The Terminator* is typically mentioned whenever the concept of autonomous weapons is discussed. But would the machines be outfitted in leather and have Austrian accents?



The sci-fi version of a killer robot, complete with two legs and multiple weapon systems. Whether such a design would be practical is a matter for debate. This type of machine wouldn't be very stealthy, nor could it easily take cover from the enemy.

iStock Photo

“...WHY SHOULD WE TRUST A CAR TO DRIVE FOR US, BUT NOT A WEAPON TO FIGHT A WAR?”



The fear inherent in the concept of killer robots is in the possibility of an army of Terminators.

KILLER BOT WARNINGS

Despite a good start to each series, most of the follow-up films and other projects have disappointed fans, and the reason is simple. The idea of machines enslaving humans seems rather far-fetched, and the lengths to which the machines go to stamp out rebellion even more so. Watch any of the *Terminator* films after the second one, or either of *The Matrix* sequels to see for yourself!

However, there are those who remain very concerned about autonomous weapons, or “killer robots.” In 2018, during the annual International Joint Conference on Artificial Intelligence (IJCAI) in Stockholm, Sweden, some of the world's top scientific minds signed a pledge that would call for “laws against lethal autonomous weapons.”

SpaceX and Tesla founder Elon Musk, as well as members of Google's DeepMind project, were among those who signed the pledge, which also has the support of the Future of Life Institute. Clearly Big Tech seems concerned that the autonomous systems—or artificial intelligence (AI)—being developed for self-driving cars and other uses present a problem when it comes to weapons.

In fairness, it is easy to see a differ-





The Common Remotely Operated Weapons Station (CROWS) is shown attached to an M2 .50-caliber machine gun without the barrel mounted, at the F Company, 2nd Squadron, 278th Armored Cavalry Regiment, 13th Sustainment Command (Expeditionary) company area at Joint Base Balad, Iraq, in April 2010.



This is a Northrop Grumman RQ-4 Global Hawk unmanned aircraft, an unarmed drone used by the U.S. military.

Dod Photos

ence between a self-driving Uber and a self-driving M1 Abrams tank, but only so much. The question perhaps Musk and those at Google, Apple, Ford and Uber—each of which is developing autonomous vehicle technology—should ask is why should we trust a car to drive for us, but not a weapon to fight a war? After all, those developing the self-driving car often tout the fail-safes, so wouldn't these also be in an autonomous weapon?

“That is yet to be determined, and there is a definite movement toward ensuring that autonomous systems are

developed with the idea of safety and security in mind,” explained Michael Blades, vice president for aerospace, defense and security at Frost & Sullivan, an international research and consulting firm.

“That said, there is much debate as to whether ‘general’ AI, where machines can make their own decisions, is achievable, or if ‘narrow’ AI, where machines can only do what they are taught, will be the functional limit,” Blades added.

HISTORICAL ANALOGIES

Humans have battled one another for eons and created some truly terrifying weapons in the process. These include nuclear, chemical and biological weapons, and any of these could present a problem. But computer technology is a bit different, in part because of how interconnected our world has become. Some computer code, for example, could do almost as much damage as an atomic bomb if it were deployed against critical infrastructure—so it is clear that technology in general could present a serious problem.

However, at the same time we should look at various analogies from history. Humans have “tamed” horses, dogs, elephants and even dolphins to varying degrees of success in order to utilize these beasts in military roles. Soldiers rode horses for eons, yet horses largely disappeared from the battlefield in only a single generation, in the 20th century.



During the Indian Mutiny (or Indian Rebellion) of 1857, as many as 800,000 Indians—and 40,000 Europeans—were killed.

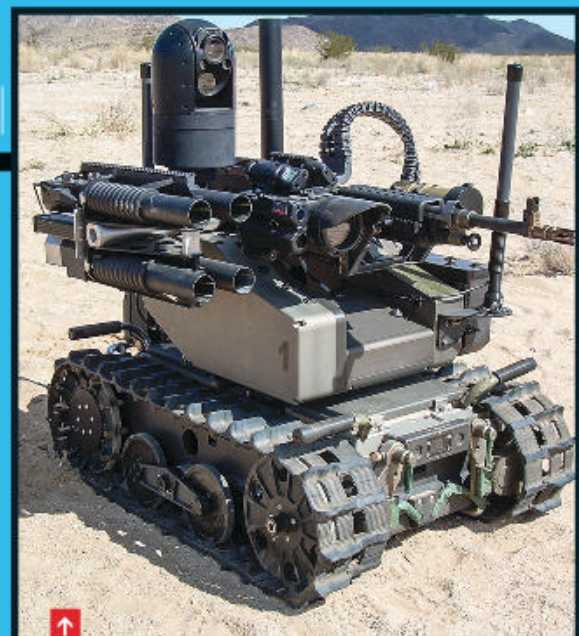


Dogs, sheep and other animals have been used to deploy mines, and even driven across minefields.

Animals can, of course, turn on their masters, but with only limited success. A dog can bite its owner, but can't develop or use weapons. The greater danger has long been in trusting human soldiers—since antiquity, there have been

stories of soldiers mutinying. The British learned this lesson 160 years ago when the East India Company's *sepoys* (native soldiers) rose up, and it took three years to suppress the uprising.

Valuable lessons were learned, which other colonial powers then followed—namely, provide your colonial troops and native auxiliary units with inferior weap-



DoD Photo

A more practical version of a killer robot is essentially a mini-tank with a weapon system mounted on top.

THE PRE-TERMINATOR URAN-9



We're likely decades away from developing anything like even the T-800 from *The Terminator*, but the first step could be the Uran-9, a Russian-designed tracked unmanned combat ground vehicle (UCGV). It was designed in 2015 by JSC 766 UPTK—currently the JSC Kalashnikov Concern, makers of the infamous AK-47. The system was designed

to deliver combined combat, reconnaissance and counter-terrorism units along with remote reconnaissance and fire support. The Uran-9's armament includes a 2A72 mod ABM M30-M3 autocannon.

To date it is the only unmanned combat vehicle actually deployed in the field. The Uran-9 reportedly has seen combat in

Syria, where it was used to support pro-government forces. According to a performance report from the 3rd Central Research Institute (CRI) of the Ministry of Defense of the Russian Federation, it was no Terminator. It performed poorly and was unable to accomplish most of the missions assigned to it.

—Peter Suci

ons. That way, if they failed to remain loyal, at least you'd have an advantage over them.

The truth is that machines might be less likely to mutiny. Unlike mercenaries—which the Indian *sepoys* really were—machines will never be motivated by money or ideology. Moreover, humans can be indoctrinated but not truly programmed.

"There is most definitely a trust issue with regard to a robot going 'rogue,' however forces are putting extensive measures in place to ensure that all safety aspects are covered," said Melanie Rovey, principal analyst at Jane's Information Group, the military and aerospace research firm.

For now, the point is largely moot, because we haven't reached a level of true automation, and even when that point is reached, a machine isn't actually "thinking" in the truest sense.

"Most autonomous weapon systems are not yet truly autonomous," added Rovey. "There will remain a human in or on the loop to ensure that the decisions that are made rest with the human. Synthetic training is a focus in the defense arena to ensure that all systems are strenuously tested and evaluated. AI and machine learning (ML) will be used to enhance and aid human decision making rather than replace it."

For the reasons that Rovey laid out, autonomous weapons might actually present opportunities that could save lives. They could take human error out of the process.

"Machines would probably be less likely to turn on their 'masters,'" said Blades. "In fact, the worry from a

The Constitution only protects what judges say it does



On June 28, 2010 outside the US Supreme Court building all smiles because of a historic Second Amendment victory, left to right, are attorney Alan Gura, plaintiff Otis McDonald and Second Amendment Foundation founder Alan Gottlieb. Gura argued both the Heller and McDonald suits.

That's why the tax-exempt Second Amendment Foundation (SAF) is supporting some 40-plus federal and state lawsuits to define the First, Second, Fourth and Fourteenth Amendments to the Constitution.

That's why SAF supported the 2008 *Heller* suit that the judges said guaranteed an individual right to keep and bear arms, and why our Foundation financed the 2010 *McDonald* suit that applied the Second Amendment rights assured in *Heller* to all the states and municipalities in America.

That's also why we financed the *Moore v. Madigan* case which forced the Illinois legislature to finally enact a concealed carry licensing system so Illinoisans could protect themselves from criminal predators, and *Ezell v. Chicago* to force the city to allow gun ranges.

That's also why SAF supported *Palmer v. DC*, to force the city to issue concealed carry licenses and *Wrenn v. DC* to ensure equality of concealed carry licensing for all residents of Washington, DC.

The list goes on as we strive to get judges to read the Constitution as we believe it should be read.

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Second Amendment Foundation

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“THE TRUTH IS THAT MACHINES MIGHT BE LESS LIKELY TO MUTINY.”

machine should not be that it turns itself into a killer robot, but a bad actor, from within or outside, could use or program the machine to do much more damage than the person alone could do. In that case, it is more important to establish impenetrable cybersecurity, before worrying about machines possibly becoming self-aware.”

THE CASE FOR KILLER ROBOTS

The very idea of killer robots is that these automated weapon systems would be free to roam a battlefield, but we’re actually decades away from any such technology, and it is unlikely that the machines would simply be assigned to “kill everything.”

In the short term, autonomous weapons could save lives. With sensors, cameras and machine learning to determine a threat, autonomous weapons could tell friendly units from the enemy, and could likely be trained to distinguish a civilian from a hostile better than a human soldier can.

“That is why there has been policy in the DoD for many years to fund unmanned aircraft systems (UAS) and cybersecurity programs and target them for reductions—if needed—last,” said Blades. “It is also why we see a major focus on capabilities like manned-unmanned teaming/loyal wingmen. Of course, UAS aren’t entirely ‘autonomous,’ but as the years go by, flight and ground systems will become more and more autonomous. Not only does it reduce manpower, it reduces the workload and stress on manned operators.”

The use of UAS already highlights how we can take out enemy targets without putting our human soldiers in harm’s way. That should help serve as proof of concept for the advantages that autonomous weapons systems could provide.

In addition, machine learning can help make for quicker decisions—something that is crucial on the battlefield.

“There are many advantages to autonomous systems. They can help to reduce the cognitive burden on the warfighter,” added Rovey. “Logistics MULEs (or Multi-Mission Unmanned Ground Vehicle) can lighten the load for soldiers by carrying supplies, weapons and so on, and combat vehicles can be sent forward before troops to carry out surveillance and reconnaissance. There have been huge advances over the past few years. However, the technology is still in a fairly embryonic stage, with testing and evaluation being key.”

AUTONOMOUS WEAPONS

FUN FACTS



The first “autonomous weapons” were anything but high-tech. One of the earliest examples was little more than a rifle attached to a can of water, invented as a way to deceive the enemy during World War I.

In late 1915, British and Commonwealth forces were ordered to pull out of their trenches on the Gallipoli Peninsula in Turkey, and a number of delayed-action systems were utilized to convince the Turkish forces that the Allied trenches were still occupied. These included the so-called “drip rifle,” invented by Lance Corporal William Charles Scurry (later Captain W.C. Scurry, MC, DCM) of the 7th Battalion, AIF, for firing a rifle by means of weights operated through water escaping from one tin into another. After about 20 minutes, the rifle would fire, by which time the British and Commonwealth troops were long gone.

During World War II, the Germans utilized the first truly remote-controlled vehicle. Dubbed *Leichter Ladungsträger Goliath* (“light load carrier,” aka Goliath tracked mine), it carried either 60 or 100 kilograms (132 or 220.5 pounds) of high explosives, and was intended to be used for multiple purposes, including destroying tanks, disrupting dense infantry formations and even demolishing buildings and bridges.

More recently, the U.S. Marine Corps deployed a UA 240G machine gun mounted to a rapid aiming platform that could be controlled by a handheld unit from up to 100 meters (328 feet) away. —Peter Suci



Goliath



Drip Rifle



Restored Goliath



UA 240G Machine Gun

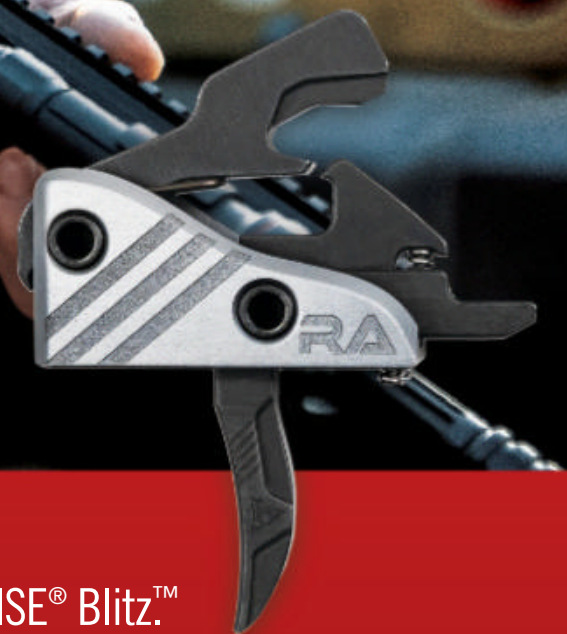




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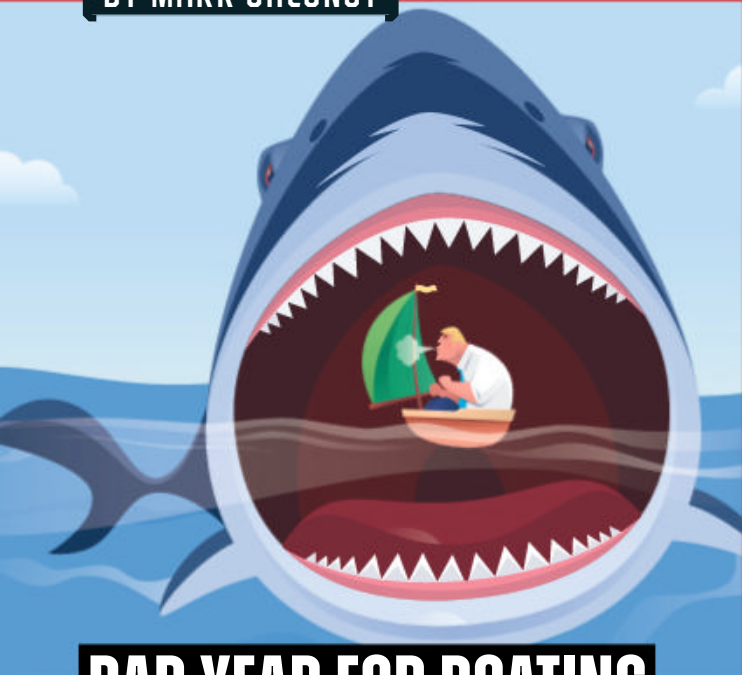
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FAKE-TICAL NEWS

A DOSE OF TACTICAL SATIRE FOR OPERATORS WHO ARE NUTS ABOUT GUNS

BY MARK CHESNUT



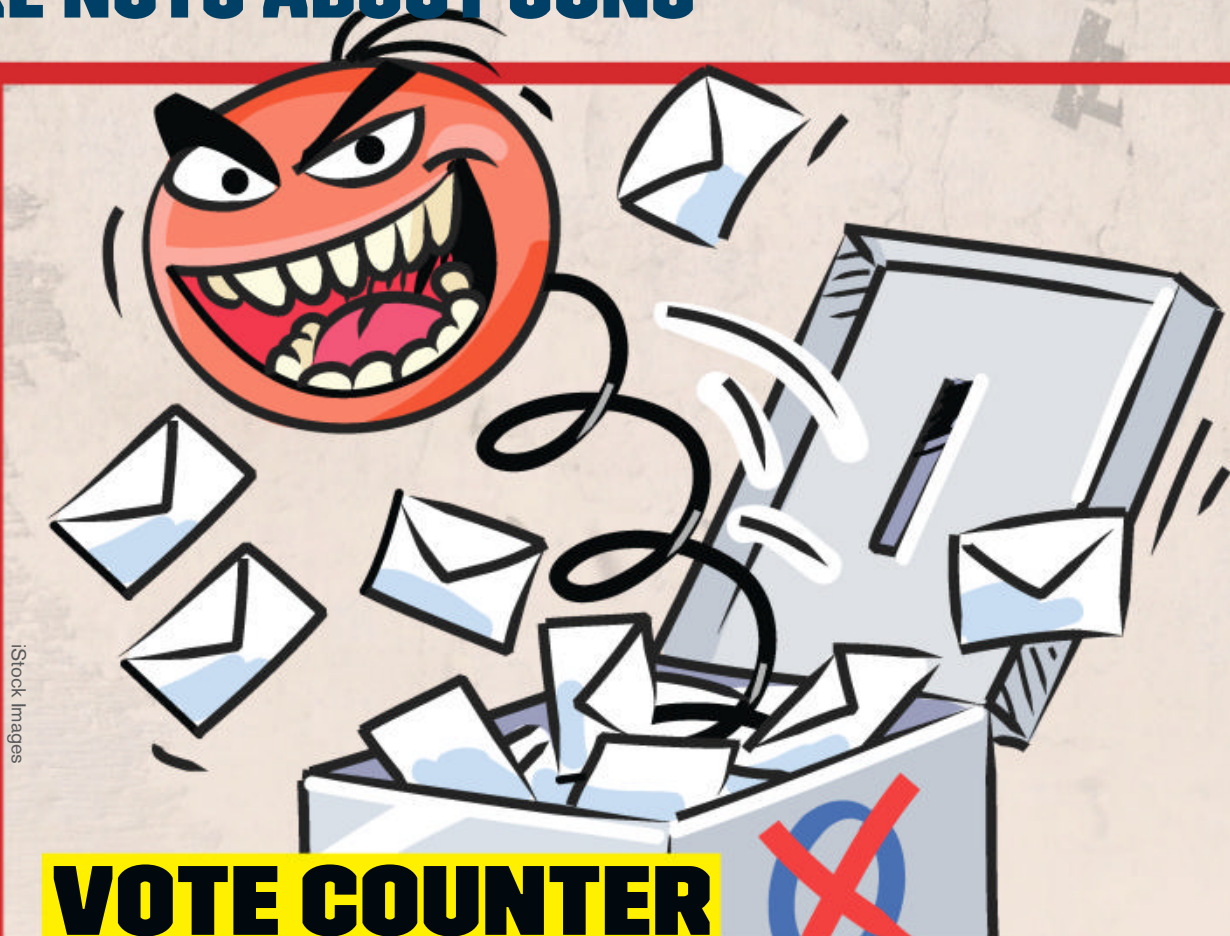
BAD YEAR FOR BOATING

A rash of boating accidents since the November election has cut the number of privately owned firearms in the country nearly in half.

One such victim was Festus Clevenger, whose boat capsized while he was traveling to his favorite small island in the ocean for some “alone” range time.

“Damndest thing you ever saw,” Clevenger said. “A rogue orca came out of nowhere—right in the deepest part of water. Lost all of my ARs, six semi-auto pistols, four revolvers, two AKs and a whole box of 30-round magazines.

“Sucks to not own a gun anymore, but I guess I’ll just have to live with the consequences. I guess there’s really no reasonable reason for someone to own that dang many guns anyway!”



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VOTE COUNTER DOESN'T UNDERSTAND REPUBLICANS' ANGER

Speaking of presidential politics, a vote counter in Detroit doesn't understand all the anger from Trump supporters over what he calls “a few measly thousands votes here and a few measly thousand votes there.”

“You'd think they just got cheated out of winning the lottery or something,” said Barnard Smith, substitute vote counter and son of a local Democrat party operative. “The sooner they get over this and we all start getting

along again, the better we'll all be. “After all, you didn't see Democrats whining like babies, throwing tantrums and threatening violence when we lost in 2016. Suck it up, buttercup. Time to move on!”



CHICAGO GANG MEMBER WORRIES ABOUT LEG SHOTS

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With dimwitted Joe Biden apparently set to become the next resident of the White House (recounts are still occurring at this writing), violent criminals are working with body armor manufacturers to develop a full set of leg armor to protect them when confronted by law enforcement. Biden repeatedly said during the campaign that instead of shooting to kill, law enforcement officers should “aim for their legs,” in order to simply incapacitate criminals.

“I don't know about everyone in my line of work, but I'd rather have a cap popped in my ass or even spleen than in my legs,” commented Hector Gomez, a gang member on the mean streets of Chicago. “My legs are my most outstanding features, and chicks really dig them. Now we have this new president coming along wanting to ruin all that. “Trump wanted us put in prison forever, but at least he wasn't calling for shooting us in the legs!”

DEMOCRATS CONFUSED OVER WHY GUN CONTROL SUPPORT TANKED

After finally reaching their four-year goal of replacing a pro-Second Amendment president with one solidly in the anti-gun camp, Democrats are questioning why so many people are suddenly afraid their privately owned firearms will be confiscated.

A Gallup survey released two weeks after the election found that support for more gun control has fallen substantially. According to poll results, Americans' overall support for more gun control stands at 57 percent, down from the 67 percent in 2018.

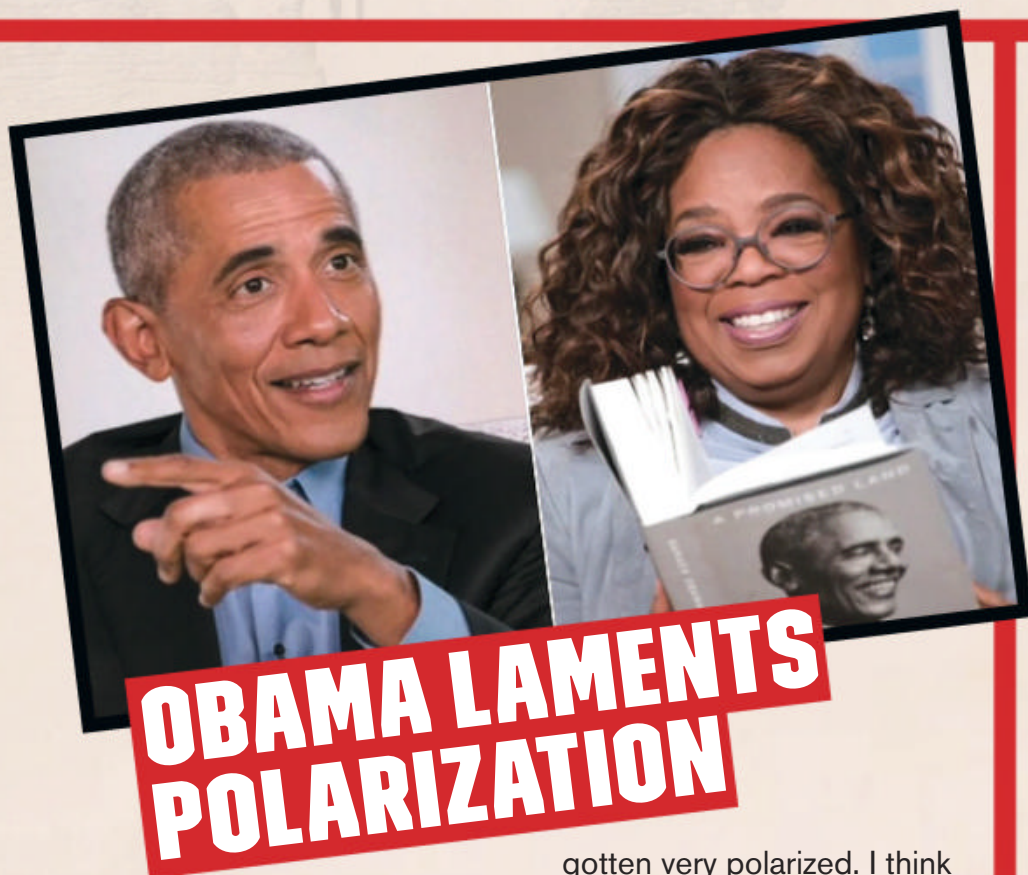
Over time, that support has fallen even further, as support

for more gun control stood at 78 percent in 1990.

"I don't understand why people suddenly think we want to take their guns," said Vice President Kamala Harris, who definitively said several times during the campaign that she favored banning assault weapons and having a "buy-back" of the firearms. "You'd think we campaigned on doing so or something."

For his part, President-elect Biden said, "Guns, what guns? We already banned AR-14s, and those hi-mag cap thingies, didn't we? Well, didn't we? I thought we did."

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OBAMA LAMENTS POLARIZATION

Former president Barack Obama, speaking to Oprah Winfrey in mid-November, lamented over the divisive nature of gun control—as if he hadn't been in the thick middle of creating much of that division.

"Gun violence is one of those issues where we are far away from the promised land," the Great Divider said in the interview. "It's become wrapped up with people's sense of identity and the degree to which the country's divided and some of this is a big rural, urban split. It's

gotten very polarized. I think unwinding the polarization around that issue is going to take some time."

When it was pointed out that he had insulted millions of Americans by saying they "cling to their guns or religion," Obama said that statement had been taken out of context.

"What I meant was they are fine folks who appreciate their guns and honor their religion," he explained. "After all the division caused by Donald Trump, we can finally unify around Joe Biden without any further ill will between the Left and the Right."

GETTING RID OF HI-CAP MAGS SHOULD BE A "PIECE OF CAKE"

Upon learning from a National Shooting Sports Foundation (NSSF) report that Americans own 150 million magazines the Biden administration considers to be "high-capacity" and wants to ban, Biden Chief of Staff Jennifer O'Malley Dillon declared confiscating them all should be no big deal.

"With Trump gone and America's divided nature healed by President Biden and Vice President Harris, I'm sure it will be a piece

of cake to get them to turn those horrible devices of war in for destruction," she said. "We've got to all come together and rally around common-sense gun safety legislation, and it's up to gun owners to do their part and join us in this heavenly endeavor."

In the same interview, Dillon also declared that socialism is compassionate, the Easter Bunny is real and that Biden's mental faculties were "just fine, thank you." 🇺🇸



Alex Landeen Photo



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