



Suppressor tech can conceal the position of a military sniper, or protect the hearing of a big-game hunter.

SUPPRESSORS:

A Rogue's Tool or a Hunters Friend?

By Aaron Brudenell and Jim Heffelfinger

We've seen it a hundred times on TV; a dark form steps out of the shadow, raises a pistol with a fat tube extending from the barrel and with the sound of "pew...pew," and someone meets his demise. These mufflers of the gun world are almost always portrayed as the tool of an assassin. After all, if you were not breaking the law, why would you care if someone heard the gunshot? Although commonly referred to as "silencers," these attachments don't actually silence the shot as the Hollywood moviemakers have led you to believe. They do, however, suppress the sound to a much lower level. For this reason, they are more accurately called "suppressors." Just how much the sound of a gunshot is suppressed depends on a variety of factors.

Many people think suppressors are illegal, but they are completely legal in 39 states and are legal for hunting in more than two dozen of those. However, they are regulated to a greater

degree than other firearms accessories. This regulation comes in the form of a stamp from the Bureau of Alcohol, Tobacco, Firearms and Explosives that is required to possess a silencer. The stamp costs \$200, with up to a 6-month wait, and requires a clean record. Apparently the process is not too difficult, because about 27,000 silencers are sold each year showing that large numbers of people think it's worth the hassle. Each individual silencer requires its own stamp. Buying the stamp is part of the registration process and you can't take possession of the silencer without the stamp. Also, you can't let others possess or use your silencer unless you are present.

There is a recent trend of more and more states beginning to allow the use of silencers for some hunting situations. Texas and Arizona recently changed their laws to allow for the use of suppressed firearms for taking wildlife and several other states are currently shepherding similar bills through their states'

Suppressors can be built into the design of a firearm (top) or attached at the muzzle by threads (bottom).



legislature. In Texas it was already legal to hunt exotics (including feral hogs) with a suppressor, but the new law that passed this March now makes it legal to hunt deer and alligators with a silencer. With more and more states allowing the possession and use in hunting situations, hunters have a lot of questions about how they work and whether perhaps they deserve a closer look.

Can you hear me now?—The sound of a gunshot

Sound is the result of pressure waves traveling through the air. The higher the pressure, the louder the sound. The farther you are from the source, the less intense the pressure wave and the softer the sound. When a gun is fired, there are four types of sound produced: 1) “uncorking” pressure from the muzzle (yes, exactly like a champagne bottle); 2) sonic boom or crack from the bullet in flight; 3) noise made by the action of the

gun cycling; and 4) impact of the bullet hitting the target. Silencers only work on reducing the muzzle noise (#1), but since that is normally the loudest source of sound, they can render a loud gunshot into something relatively quiet.

When an effective silencer is used, you may notice the other sources of sound more, or for the first time. For example, supersonic ammunition (faster than the speed of sound) will produce noise along the flight of the bullet as it breaks the sound barrier (#2). To effectively suppress the sound of a firearm, subsonic (less than about 1,100 feet per second) is used to eliminate this noise. Also, with the use of a silencer, you may notice for the first time the noise made by the action of a semi-automatic firearm cycling. For this reason, bolt or lever actions will be quieter than semiautomatics because there is no action noise (#3). In some situations, you might notice more sound from the bullet impacting the targets

(#4), such as steel plates at close range.

How suppression works

A suppressor functions by cooling and delaying the release of gasses from a gunshot before they escape behind the bullet (uncorking). You can think of this in terms of a balloon; if you pop a balloon it goes “bang,” but by untying it and letting air out of the neck, the gases are released more slowly and it doesn’t produce that loud noise. A modern silencer will have a design that effectively slows the escaping gases by forcing them to swirl around in internal chambers. The swirling gasses inside the silencer slow down so much that by the time the bullet leaves the end of the suppressor, the gas leaks out weakly and fails to produce most of the uncorking sound. Suppressors also are made of materials that conduct heat and that absorbs some of the sound. Aluminum, high temperature steel alloys and, recently, titanium are common materials



In most cases, a variety of subsonic handgun ammunition can be found for a given caliber, but it’s not always labeled as such.

Suppressors adapted for use on .223 caliber “sport utility rifles” are becoming more popular with varmint hunters because it increases the opportunity to shoot more than one coyote from a single stand.



for suppressors to allow the hot gases to cool before escaping.

Most silencers look like fat tubes or cans with holes at the center of each end for the bullet to pass through. Because of their looks and the frequent use of aluminum construction, they are often referred to as “cans” by the “in crowd.” Inside a silencer you will see dividing baffles that create segmented air chambers to allow the bullet to pass safely down the center, but force the escaping air pressure to detour and take a longer way around. Early baffle shapes were simplistic, but today’s engineers have used computer modeling and knowledge of fluid dynamics to produce more effective and sophisticated silencers. As a result, there can be a big difference between two similar-looking silencers. Sometimes a less expensive silencer is a better value because of its internal design. The proof is in the performance and, in some cases, the longevity and durability of the design.

Types of “cans” and mounting

Generally there are two types of silencers: those that are permanently part of the firearm (integral) and those that are detachable. Integral suppressors are built directly onto a firearm and usually can’t be removed except by the manufacturer or a qualified gunsmith. Designs of this type tend to offer better sound reduction because they are fine-tuned to that particular firearm and might have certain modifications to the gun that help with sound dissipation. Because they are permanently affixed to the gun, they may be harder to maintain and clean.

Detachable silencers may not be as quiet as integral silencers in all cases, but they have the advantage of being usable on multiple firearms (one stamp per silencer, but it can be used on more than one gun). Also, when disassembled, it is easier to store and transport the gun. The most common mounting technique is with a muzzle that has exterior threads on the barrel that match the internal threads of the suppressor. It is important that the silencer is aligned properly on the barrel so that the bullet does not impact the internal edges as it is passing through.

Reliability and function

In general, manually operated firearms (bolt, lever, pump actions) are ideal for silencers because there is no action noise associated with the shot and they also don’t suffer from reliability issues that can arise when a semiautomatic firearm is forced to function with a can attached to end of the barrel. Also, with a silencer there is more pressure forced back on the action and that can speed up the cycling and also result in more fouling and residues blown into the action. It is important to spend some time with a firearm and make sure it will function reliably with a particular silencer. For firearms that do not operate reliably when suppressed, there are accessories that can be added to or built into a silencer to improve reliability.

Because most silencers attach to the muzzle, a firearm with a tubular magazine could be difficult to reload with the fatter suppressor attached to the muzzle. The larger diameter of a silencer can also block the sights if they are mounted low on the gun. Also, the added weight on the end of a barrel may affect the point of impact of some firearms because it could change the way the gun recoils. There are advantages of having a quieter firearm for hunting and target practice, but this comes with the potential of reduced function and reliability. There are a number of variables that come into play when mating a firearm with a silencer.

Ammo selection

When setting up a gun to operate with a silencer, ammo selection carries with it some important considerations. There are three things to consider when selecting ammunition to use with a suppressor. Velocity is the most significant because, as mentioned above, supersonic ammunition (1,100 feet per second or more) produces its own sound in flight that cannot be reduced by the suppressor. While a high-powered rifle may be quieted for the shooter, the down-range noise made by the bullet can still be heard by anyone nearby. Handgun hunters have less to worry about when it comes to ammo selection because modern pistol ammunition offers a good selection of choices below the



A suppressor on a bolt-action .22 rifle can be virtually noiseless with subsonic ammunition. However, with high-velocity ammunition, the bullet will create a sonic boom and you'll lose much of its benefit.

sound barrier for most calibers.

Another consideration is bullet stability. Unusual bullet weights and lengths could be problematic if they're not properly stabilized. If a bullet is not flying straight and true as it enters a silencer, it could impact the internal structures. This can occur occasionally with normal ammunition resulting in little or no damage to the silencer, but frequent bullet strikes will reduce the life of the silencer.

Finally, the general power of the ammunition is important. Lower-powered ammunition has less gas to contain so you can expect it to be a little quieter. A more important concern is whether the silencer is capable of handling the pressures generated by the ammunition. For example, it would be a mistake to use a silencer intended for .22 Long rifle on a .223 Remington rifle even though the caliber is the same (and thus the hole down the center). The pressure and heat generated by the more powerful ammunition might overwhelm a silencer designed for only rim fire.

Safety

A well-designed suppressor will take a lot of the energy that would normally make sound and convert it to heat. This production of heat means that silencers get hot! For one or two shots this heat won't be significant; but as the number and frequency of shots increases, so will the temperature of the suppressor. This may be inconvenient or dangerous if the shooter is not constantly aware

of this. Many suppressor enthusiasts carry a cooking hot pad or glove to the range with them. Trying to remove a hot silencer is about the same as grabbing the muffler of a car that's been driven for a while. From the shooter's perspective, a hot silencer can also produce enough of a mirage to distort their sight picture.

Applications for hunting

The late Mary Grace Horlock of the Rio Paisano Ranch (Brooks Co.) had a golf cart with the words "The Assassin" painted on the front. Her hunting prowess was legendary on the ranch (earning her that nickname), but even so, she did not have a weapon with a silencer affixed to the end. Most people associate silencers with sinister acts and would not think of using one in a hunting situation. Since suppressors for shotguns are mostly (with a few exceptions) a fictitious product of Hollywood, bird hunting is not likely to see the use of silencers in the field. In states where it is legal, big game and varmint hunters will undoubtedly take notice and start to experiment with these shooting accessories.

Like any form of hunting or choice of weapons, there are advantages and disadvantages to be considered. Suppressors may offer some advantages in certain situations and may create other negative issues as well. There is concern that hunters with suppressed weapons do not project the kind of image that is well received by the 80 percent of the

public that doesn't hunt.

Quiet rifles can mean poachers could get away with robbing sportsmen of more game animals than they already do. On the other hand, we may see quiet night-time armadillo guns that don't disturb the neighbors, coyote hunters taking more per stand because the first shot doesn't scare the rest away, or big game hunters in grizzly country not wanting every bruin in the county to hear their gunshot.

A complete discussion of the advantages and disadvantages of hunting with suppressors is beyond the scope of this article. In Europe, the use of silencers is encouraged. For them it is a matter of good health (hearing protection) and being considerate of your neighbors, especially near urbanized areas. On this side of the "pond," we have evolved a different relationship with silencers since they were restricted in 1934.

For good or bad, the pendulum seems to be swinging back to allow for ownership in more states and the increasing opportunity to use a muffler on your gun while hunting. There is sure to be much discussion of silent hunting in the near future and that discussion should be based on hunters having a solid understanding of how these devices work. Whether this is a benefit or distraction to hunting and hunters is largely a personal call and should be dependent upon whether they help or hurt overall wildlife conservation and the public's support of hunting. 