

“JUST LIKE BIRD HUNTING”



**THE THREAT TO CIVIL AVIATION FROM
50 CALIBER SNIPER RIFLES**



Violence Policy Center

The Violence Policy Center is a national non-profit educational organization that conducts research and public education on firearms violence and provides information and analysis to policymakers, journalists, grassroots advocates, and the general public. The Center examines the role of firearms in America, analyzes trends and patterns in firearms violence, and works to develop policies to reduce gun-related death and injury.

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- *Cease Fire: A Comprehensive Strategy to Reduce Firearms Violence* (Revised, October 1997)

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Introduction

The cost-effectiveness of the Model 82A1 cannot be overemphasized when a round of ammunition purchased for less than 10USD can be used to destroy or disable a modern jet aircraft.

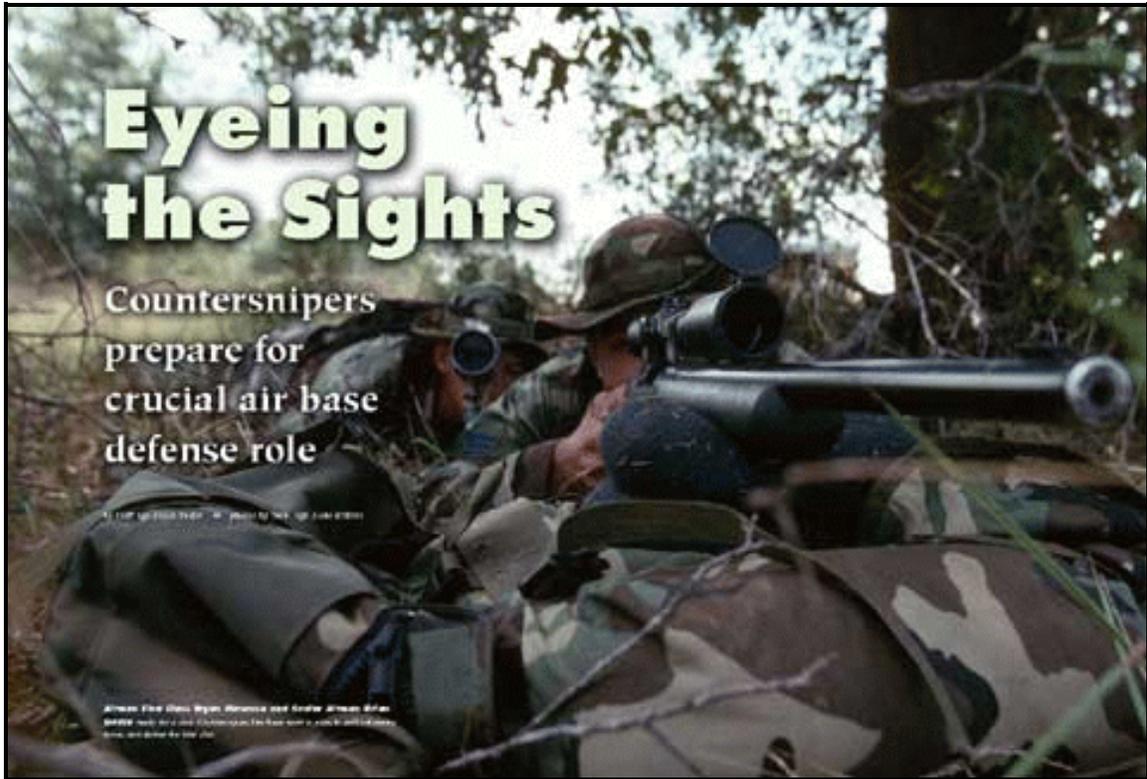
—Barrett Firearms Manufacturing Inc. brochure advertising its Model 82A1 50 caliber sniper rifle

Here is a hair-raising scenario for anyone who has ever sat inside a giant commercial jetliner—fully laden with hundreds of passengers and tons of fuel—as it waited at a terminal gate or taxied to the runway at any of America’s many busy airports:

Peering through scopes atop rifles that can hit a target from better than a mile away, these silent hunters stare at you and your aircraft....As they watch, one of them slips a .50 caliber bullet into the chamber of a long-barreled rifle pointed at the side of the E-3 Sentry aircraft 500 meters away....The fire from the muzzle ignites the evening air as the projectile whistles down range. It punches through the side of the aircraft, ripping through delicate components onboard the plane. A second sniper 100 yards away fires, as does a third, launching rounds into the cockpit and the wing fuel tanks. As the white-hot bullets hit, the wing tanks explode, ripping the plane apart....¹

Fevered fantasy? Not to the U.S. Air Force. This scenario of a potential terrorist attack with 50 caliber anti-armor sniper rifles is excerpted from the Air Force’s official magazine, *Airman*. The 2001 article explains that the Air Force has developed a cadre of specially trained countersnipers to respond to the 50 caliber sniper rifle threat to its aircraft, fuel tank farms, control towers, and personnel. The danger emerged over the last 20 years with the invention and proliferation of the 50 caliber anti-armor sniper rifle, a weapon that from 1,000 to 2,000 yards away is capable of devastating strikes that can not only punch through armor, but turn aircraft and their fuel into exploding balls of fire.

The threat to civilian aviation. The threat to civilian aviation from 50 caliber anti-armor rifles is even more serious than the threat to air force bases. This threat is not a gun control issue, but a national security issue. Civilian aircraft, airports, and airline offices have been prime terrorist targets since the mid-1960s—but they have much less protection than Air Force bases. No countersniper teams lie hidden at the perimeters of America’s sprawling and heavily trafficked commercial aviation facilities to protect them from terrorist attack. In fact, most civilian perimeters are unguarded.



This article from the official U.S. Air Force magazine, *Airman*, describes how the Air Force has prepared to defend its bases at home and abroad from 50 caliber sniper rifle attacks by terrorists. The 1995 RAND report to the Air Force that inspired much of this concern noted civilian facilities are also vulnerable. Yet civilian authorities show little interest in stopping the unregulated sales of long-range, anti-armor 50 caliber sniper rifles in the civilian market.

In any case, airplanes, fuel trucks, and terminal buildings of most major airports are easily within the striking range of the 50 caliber sniper rifles that the Air Force sees as a threat. This range extends far beyond the fences of most airport security perimeters, and well beyond the defensive fire that any security personnel who might happen to be in the area of attack could muster.

Terrorists and 50 caliber anti-armor sniper rifles. There is no question that these weapons of war are available to terrorists—the Violence Policy Center documented in earlier reports how agents of the Irish Republican Army (IRA) and Osama bin Laden easily bought 50 caliber sniper rifles on the U.S. civilian market. It was easy for them and other extremists because 50 caliber sniper rifles are less-regulated than handguns on America’s civilian gun market.^a They are also one of the hottest items in that market today. Because of lax federal recordkeeping, no one knows for sure how many 50 caliber sniper rifles have been sold to civilians. But the number is certainly in the thousands, possibly in the tens of thousands. And the armor-piercing, incendiary, and explosive ammunition the 50 caliber sniper rifle fires is routinely bought and sold on the unregulated civilian ammunition market with no questions asked. With modest diligence, any serious seeker and certainly any seasoned terrorist can obtain the devastating firepower of this ammunition through the Internet, the mail, licensed dealers, and gun shows.

The unfettered sale of these rifles and their incredibly destructive ammunition are the ingredients of a disaster waiting to happen. In contrast, the threat of an attack by rockets against aircraft and airport facilities is well understood. Government and industry alike work to keep such weapons out of the hands of terrorists. But the 50 caliber sniper rifle—touted by its inventor as the full equivalent in firepower of rockets—is routinely overlooked in discussions of aviation security. This remains so *even though anti-terrorism experts have warned, and experienced snipers agree, that the 50 caliber anti-armor sniper rifle is ideal for long-range attack against aircraft and airfield facilities—and even though the inventor and leading manufacturer of the 50 caliber sniper rifle has described jet aircraft and helicopters as “likely” targets for what his patent frankly calls an “anti-armor gun.”*^b

^a Under federal law, an 18 year old cannot buy a handgun from a federally licensed dealer, but *can* buy a 50 caliber anti-armor sniper rifle. For detailed documentation about terrorists, extremists, and common criminals who have bought and used 50 caliber sniper rifles, see the October 2001 Violence Policy Center report *Voting from the Rooftops: How the Gun Industry Armed Osama bin Laden, other Foreign and Domestic Terrorists, and Common Criminals with 50 Caliber Sniper Rifles*.

^b The history, range, and power of the 50 caliber anti-armor sniper rifle, and the documented vulnerability of aviation facilities to its power, are detailed in Sections One and Two.

Publicly available detailed attack plans. Detailed information—complete with diagrams—explaining *exactly* how to attack jet aircraft and helicopters with 50 caliber sniper rifles has been published in at least two books by former military snipers. Both of these books and the credentials of their authors are widely praised as authoritative in the community of American sniper aficionados. These books, and other similar information, are easily available to any terrorist, common criminal, or crackpot with a grudge.^c

A failure of regulation. Incredibly, although other weapons of war—including the 50 caliber fully automatic machine gun from which the 50 caliber rifle is derived—are tightly regulated under the National Firearms Act, the 50 caliber anti-armor sniper rifle is not. This is so in spite of the well-documented civilian purchases by terrorists such as the IRA and Osama bin Laden, and a variety of domestic militias and similar radical groups.

This report describes:

- ! The range and explosive firepower of the 50 caliber anti-armor sniper rifle in Section One.
- ! The vulnerability of civilian aircraft—jetliners, executive jets, and helicopters—and airport facilities (such as control towers and fuel tanks) to explosive incendiary attack at very long range by the 50 caliber anti-armor sniper rifle in Section Two.
- ! Simple legislative steps to keep 50 caliber anti-armor sniper rifles out of the hands of terrorists, while allowing legitimate civilian use in Section Three.

^c These are discussed in Section Two.

Section One:
The Range and Power of the 50 Caliber Anti-Armor Sniper Rifle

Q. And at an approximate distance of, say, a thousand yards—which would be ten football fields—based upon the kinetic energy, the weight, and the speed of the projectile that is fired from your rifle, what kind of material-penetrating capability does the .50 caliber have?

A. It passes through quite a lot....there is not much it wouldn't go through.

—Sworn testimony of Ronnie G. Barrett, *United States v. Angel Manuel Alfonso et al.*, November 30, 1999 (U.S. District Court, P.R.)²

The 50 caliber anti-armor sniper rifle has proven itself to be an awesome weapon on the battlefield, with range and power that stand out even among military small arms. In 1991's Operation Desert Storm, U.S. forces using 50 caliber sniper rifles struck enemy targets routinely from a range of 1,600 meters (1,750 yards), including knocking out Iraqi armored personnel carriers.³ More recently, a Canadian sniper claimed a world record hit on a Taliban fighter at a range of 2,430 meters (2,657 yards)—over a mile and a half.⁴

The 50 caliber anti-armor sniper rifle was invented in the early 1980s by Ronnie G. Barrett, who derived it from the Browning 50 caliber machine gun.⁵ His company—Barrett Firearms Manufacturing, Inc.—is today the leading supplier of 50 caliber anti-armor sniper rifles to U.S. military forces and many other armies of the world. Barrett rifles are also distributed—through federally licensed firearms dealers—to civilian buyers in the United States. These have included such unsavory customers as representatives of Osama bin Laden, the Irish Republican Army, and assorted domestic militia groups. Having created a new market, Barrett now faces mushrooming, lower-priced competition as new manufacturers spring up to cash in on the booming niche.^d

^d For more detailed discussions of the 50 caliber market, see the broader October 2001 Violence Policy Center report on the 50 caliber sniper rifle, *Voting from the Rooftops: How the Gun Industry Armed Osama bin Laden, other Foreign and Domestic Terrorists, and Common Criminals with 50 Caliber Sniper Rifles*, and the February 2002 report on sales to bin Laden, *The U.S. Gun Industry and Others Unknown: Evidence Debunking the Gun Industry's Claim that Osama bin Laden Got His 50 Caliber Sniper Rifles From the U.S. Afghan-Aid Program*.

An Anti-Armor Weapon of War

In the face of widespread concern about the free-wheeling sale of such weapons of war to the public, firearm manufacturers and their allies in the gun lobby invented a revised history of the 50 caliber anti-armor sniper rifle. They now claim that it was designed to meet the benign demands of civilian marksmanship competition. For example, Ronnie Barrett told an interviewer earlier this year, "Everything progresses to the next level. As the hobby advanced up, the .50 caliber was the next advance."⁶

However, the written record of Barrett's invention and his early marketing strategy reveals that in fact the 50 caliber rifle was not designed as a recreational toy to meet the demands of any "hobby." On the contrary, the record created by Barrett himself shows that his new gun was always primarily intended to be a weapon of war. And—as the next section will describe in detail—jet aircraft, helicopters, as well as light armor were always intended to be among its principal targets.

Thus, Ronnie Barrett's 1987 patent calls his new invention an "anti-armor gun." He described the rifle in his patent claim as a "shoulder-fireable, armor-penetrating gun."⁷ And he related the genesis of his anti-armor gun as follows:

The recoil and weight of the Browning M-2 heavy-barrel machine gun (50 cal.), belt-fed, make it unsuitable for firing from the shoulder. The bolt-fed sniper rifle of smaller weight and caliber will not penetrate armored targets. The bolts of guns of a caliber that will penetrate armored targets are often broken by recoil because of excessive strain on the lock lugs. Thus, there is a need for a light-weight, shoulder-fireable, armor-penetrating gun that can stand up to heavy duty use. After extended investigation I have come up with just such a gun.⁸

Nowhere in his patent claim did Barrett make any mention of civilian target or hobby use for his "armor-penetrating" gun. Plainly put, the whole point of Barrett's new gun as described to the U.S. Patent Office was to put the armor-busting power of the 50 caliber machine gun into a rifle that could be fired from the shoulder. In fact, a contemporary photograph of the young inventor shows him doing just that—firing the "bullpup" version of his new 50 caliber anti-armor gun from the shoulder.^e

^e As the next section will explain in more detail, this photograph has special significance, because defenders of the 50 caliber sniper rifle often claim that it is too bulky and its recoil too great to fire from the shoulder. This claim is refuted both by the early photo of Ronnie Barrett and by a video clip from the Barrett Internet web site, both of which show the bullpup model of the 50 caliber anti-armor sniper rifle being fired standing, from the shoulder.



Contrary to a common assertion, some models of the 50 BMG sniper rifle can be fired from the shoulder. This photo from the mid-1980s shows a person alleged to be the inventor of the 50 caliber anti-armor rifle firing a short, or "bullpup," version of the rifle from his shoulder. One article posted on the manufacturer's Internet web site stated that this model was designed specifically to shoot down helicopters in Afghanistan during the war against Soviet occupation.

Records from Barrett's federal firearms license file, obtained through the Freedom of Information Act (FOIA) from the federal Bureau of Alcohol, Tobacco, and Firearms (ATF), also make clear that his intention from the beginning was to market his newly designed 50 caliber anti-armor sniper rifle primarily to the military and law enforcement. Thus, the written report of the ATF agent who delivered Barrett's first federal firearms manufacturer's license to the company in 1984 states:

Mr. Barrett said that this is a sniper-type weapon, and he intends to try to market it to the U.S. military or police departments prior to considering sales to the public. He said that it will be quite expensive and probably of interest only to collectors. He said that the number manufactured will be limited unless a large military sale is possible.⁹

Note that from the very beginning Barrett described his new armor-piercing gun as a "sniper-type weapon." The gun lobby has tried vigorously to persuade the world that 50 caliber anti-armor rifles are not sniper rifles but sporting guns.^f The documented word of the inventor himself—present at the creation—shreds that argument.

Extended Range and Accuracy

Advertising, military manuals, the writings of experts, and civilian owner comments all demonstrate that 50 caliber anti-armor sniper rifles are accurate at ranges of at least 1,000 yards, and in the hands of a trained marksman, nearly 2,000 yards. "With confirmed hits out to 1800 meters, the Barrett model 82A1 is battle proven," Barrett Firearms states in its promotional brochure.¹⁰ In fact, U.S. forces using Barrett M82A1s routinely engaged Iraqi forces out to a range of 1,600 meters (1,750 yards) during the 1991 Gulf War.¹¹ Another manufacturer, Aurora Tactical, says that its Model 650 Special Light Anti-Materiel Rifle (SLAMR) "enables a skilled marksman to deliver exceptionally accurate fire on targets in excess of 1500 yards."¹²

Destructive Power

The 50 caliber sniper rifle's threat is a blend of long range and massive power. Here is Barrett's description of the power of its Model M82A1, widely available on the civilian market, to destroy airplanes and other "sophisticated targets."

^f See the May 1999 VPC report, *One Shot, One Kill*, pp. 9-11 for a detailed discussion of the gun industry's deliberate (and admitted) program of semantic evasion, in which sniper rifles are transformed into "tactical rifle," "long range rifle," "sharpshooter rifle," "match rifle," etc., and thus sanitized for marketing purposes.

This revolutionary .50 caliber semi-automatic rifle allows sophisticated targets to be destroyed or disabled by a single soldier. Armored personnel carriers, radar dishes, communications vehicles, aircraft and area denial submunitions are all vulnerable to the quick strike capability of the Barrett 82A1. With decisive force and without the need for the manpower and expense of mortar or rocket crews, forces can engage the opposition at distances far beyond the range of small arms fire....The advantages are obvious when you consider that many of the same targets for rocket and mortar fire can be neutralized with M33 ball, API M8 or Multipurpose ammunition.¹³

An excerpt from the U.S. Army's manual on urban combat also emphasizes the 50 caliber sniper rifle's ability to destroy materiel targets such as airplanes:

These heavy sniper rifles were originally intended as anti materiel weapons for stand-off attack against high-value targets, such as radar control vans, missiles, parked aircraft, and bulk fuel and ammunition storage sites....It is their ability to shoot through all but the heaviest shielding material, and their devastating effects, that make them valuable psychological weapons.¹⁴

50 Caliber Ammunition Available on U.S. Civilian Market

Although originally designed for heavy military use, all types of 50 caliber ammunition are readily available to civilians in the United States—and thus easily available to foreign and domestic terrorists. This, of course, is wholly aside from the fact that military ammunition stocks also can be procured from underground sources.

Arms and ammunition—including such destructive items as M-16 assault rifles, machine guns, TNT, dynamite, plastic explosives, land mines, and hand grenades—are regularly stolen from U.S. military armories.¹⁵ A recent U.S. Department of Justice Inspector General report revealed that even the FBI cannot account for hundreds of missing firearms.¹⁶ Fifty caliber sniper rifles have proliferated in military forces around the world, and 50 caliber ammunition is made in more than 30 countries. Those foreign forces, including some that are less than friendly to the United States, have stocks of military ammunition that are available to any terrorist with the right connections. Arms and ammunition are also stolen from these foreign forces, friend and foe alike, sometimes on a staggering scale.¹⁷

RANDMR606-4.1

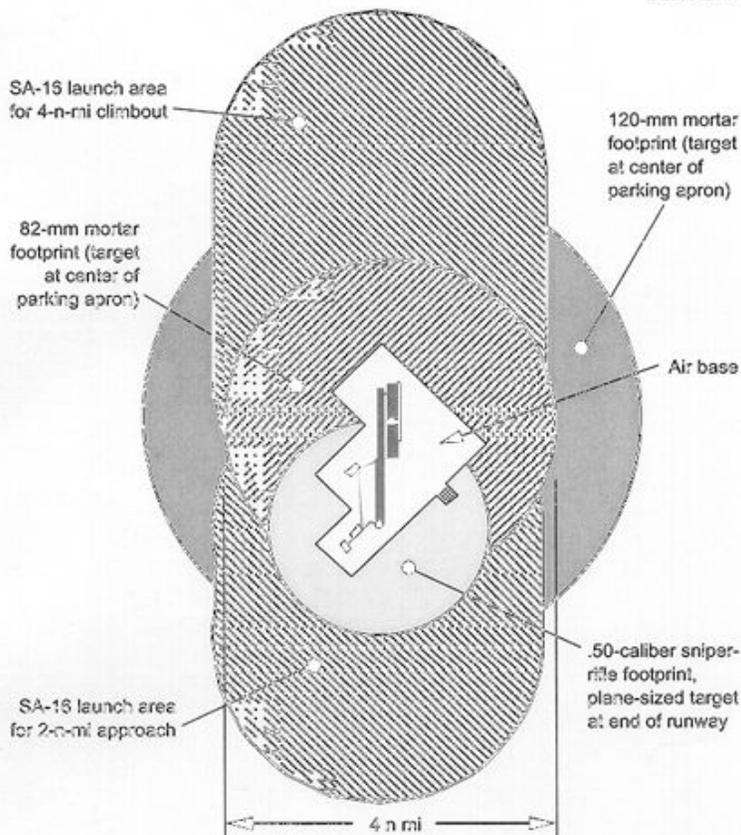


Figure 4.1- Notional Threat Standoff Footprints

This graphic from a 1995 RAND report to the U.S. Air Force illustrates the long-range threat to aircraft from 50 caliber sniper rifles and other “standoff” weapons—those that can strike from beyond the range of typical small arms defensive fire. Civilian airports are markedly less well-protected than military airbases from such standoff attack.

The 50 caliber sniper rifle's performance is substantially enhanced by the use of ammunition specially designed to destroy hard targets—ammunition that makes the rifles what expert Mark V. Lonsdale calls "a cost effective way to engage the enemy's high-tech equipment, light skinned vehicles and aircraft, especially when compared to the cost of hitting the same targets with rocket or mortar fire."¹⁸

Armor-piercing and incendiary ammunition. The U.S. Army says that the basic 50 caliber armor-piercing round is designed for use "against armored aircraft and lightly armored vehicles, concrete shelters, and other bullet-resisting targets."¹⁹ The armor-piercing effect is achieved by the bullet's design, which wraps a hardened core of a substance like manganese-molybdenum steel with a softer metal jacket.²⁰ Incendiary ammunition is self-descriptive, used for "incendiary effect, especially against aircraft."²¹ In other words, it sets things like airplanes, fuel, and other combustible materials on fire.⁹ Tracer ammunition, familiar to the public from scenes of night combat, leaves a visible trail of incendiary light. Variant rounds combine armor-piercing, incendiary, and tracer effects.²²

Saboted Light Armor Penetrator (SLAP) Ammunition. Designers of anti-armor ammunition have long used the idea of replacing a given caliber gun's projectile with a projectile of smaller diameter but more dense material. In order to seat the smaller projectile in the larger ammunition case, and to gain the necessary spin from the gun's rifled barrel, the projectile is wrapped in a "sabot" or "shoe." The shoe rides the length of the gun's barrel, then drops away from the projectile when it exits the barrel. The much higher velocity of a "saboted" round enhances its armor-piercing performance.

The U.S. Marine Corps sponsored development of 50 caliber SLAP ammunition in the 1980s, and it was used in 1991 during the Gulf War's Operation Desert Storm. It uses a .30 inch heavy metal (tungsten) penetrator in a plastic shoe, which is .50 inch in diameter. "Since the mass of the sabot penetrator is much lighter in weight than normal ball .50 caliber ammunition, SLAP's velocity can be significantly and safely increased," according to the Marine Corps. "This produces a very fast round with a very flat trajectory which enhances hit probability...and extends the light armor capability...significantly."²³

According to Winchester, the civilian contractor that developed the 50 caliber SLAP round, it delivers "superior and proven performance against lightly armored vehicles and armoured [sic] attack helicopters at ranges up to 1500 meters."²⁴ Clearly, a round that has "proven performance" against an armored attack helicopter

⁹ Fifty caliber sniper rifles have been banned from some public shooting ranges because of fires set by enthusiasts firing various types of incendiary rounds.

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<p>.22 AMMO</p> <p>SSS Supersniper, 60 grain, Subsonic 22LR bullet has been shown to go through 24 inches of Ballistic gelatin</p> <p>500 brick \$30.00 Aguila 22LR Colibris a 20 grain Conical bullet with no gun powder. Sounds like a snap of your fingers when shot, 375 FPS. Great for shooting cans in the backyard.</p> <p>500 brick \$14.00 Aguila 22LR Super Colibris with higher velocity hollow point bullet. 500 brick \$18.99</p>	<div style="text-align: center;">  <p>FIOCCHI AMMUNITION</p> </div> <p>9mm 115 gr. FMJ \$134.99 delivered 40 S&W 170/180 gr. FMJ \$187.99 delivered 45 ACP 230 gr. FMJ \$214.99 delivered</p>	<p>.308 South African</p> <p>This ammo comes from the major military production plant in South Africa. Denet. It is non-corrosive and Berdan primed. Great ammo for blasting. The ammo is packed 140 rounds to a battsack and 980 rounds to a case.</p> <p>140 rounds \$24.99 980 round case \$129.95</p>
<p>7.62x39 Stripper Clips</p> <p>Original Chinese Limited Quantity</p> <p>Case (1,000) \$150.00 Per 100 \$20.00 Per 20 \$6.00</p>	<p style="text-align: center;">! TRACERS ! SPECIALTY</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>INCENDIARIES/STARBURST INCENDIARIES</p> <p>Starbursts have additional titanium flakes; sparks on impact</p> <p>9mm, 40, 45, 223, 308, 30-06, 7.62x39 10 round bag for \$20.00 12 gauge, Incendiary slugs 5 for \$20.00</p> </div> <div style="width: 45%;"> <p>ARMOR PIERCING</p> <p>223 NATO Green Tip; GI Issue, 40 rounds for \$16.00 223 Silver Tip (API) Incendiary and Silver/Red Incendiary Tracers (APIT), 10 rounds for \$22.00 30-06 Silver Tip Incendiary (API), 10 rounds for \$22.00 30-06 Black Tip, 20 rounds for \$15.00</p> </div> </div> <p>TRACER</p> <p>223, 308, 30-06, 20 rounds for \$12.00 9mm, 40, 45, 7.62x39, 10 rounds for \$15.00</p>	<p>30-06 Russian</p> <p>168 gr. S.P.</p> <p>500 round case SALE \$149.95 delivered!</p>
<p>7.62x54R</p> <p>This is 1980 production from Albania. It comes sealed in 440 round tins, 2 tins per case. It is brass cased and only mildly corrosive.</p> <p>440 round tin \$49.95 880 rounds \$89.95</p>		<p>50 BMG</p> <p>API/100 \$149.95</p> <p>Yugo 50 BMG Ball</p> <p>100 \$119.95 200 \$219.95</p> <p>8mm Yugo on Browning Links</p> <p>1,000 rounds non-corrosive Brass case \$99.95</p>

This ad from the August 2, 2002, edition of *Gun List* newspaper demonstrates how easy it is to buy 50 BMG armor-piercing ammunition on the civilian market. In addition to over-the-counter sales, other common sources of 50 BMG armor-piercing ammunition include sales by ammunition dealers through their Internet web sites, sales by individuals through Internet "auction" sites, individual and dealer offers of ammunition for sale on special interest bulletin boards, firearm accessory specialty catalogs, and person-to-person transactions at any number of venues, including gun shows.

at 1,600 yards is, in the hands of any terrorist group, a clear threat to every form of commercial aviation, including scheduled airliners, executive jets, and helicopters.

Raufoss Multipurpose (armor-piercing, explosive, incendiary) Ammunition. The crown jewel of 50 caliber sniper rifle ammunition is the Raufoss multi-purpose round, developed by a Norwegian company and manufactured under license by several companies, including Winchester. Said by experts to be the most popular round with U.S. military snipers,²⁵ it was used to devastating effect by U.S. forces in the 1991 Gulf War.

Designated the MK211 by the U.S. military, the round combines armor-piercing, explosive, and incendiary effects and uses a “highly effective pyrotechnically initiated fuze...[that] delays detonation of the main projectile charge until after initial target penetration—moving projectile fragmentation and damage effect inside the target for maximum anti-personnel and fire start effect.”²⁶ According to its developer, Nordic Ammunition Company (NAMMO), the round can be used in “sniper rifles similar to [the] Barrett M82A1,” has “the equivalent firing power of a 20 mm projectile to include such targets as helicopters, aircrafts [sic], light armour vehicles, ships and light fortifications,” and can ignite JP4 and JP8 military jet fuel.²⁷

According to the Marine Corps, the Barrett “M82A1A...fires the .50-caliber RAUFOSS ammunition, which contains a tungsten penetrator and a more powerful explosive charge than the API ammunition...it has penetrated an inch of steel at 2000 yards.”²⁸ *Jane’s International Defense Review* estimates that the round is “probably capable of disabling a man wearing body armor who is standing behind the wall of a house at 2,000m.... (and) can perforate the foundation of a high-rise building (20cm reinforced concrete) at 400m.”²⁹ Reasonable persons probably would agree that blasting through 20 centimeters (7.87 inches) of reinforced concrete from four football field’s distance is an impressive performance.

Availability of Specialized 50 Caliber Ammunition on U.S. Civilian Market

The implications of the potential uses against civilian aviation facilities to which a terrorist might put 50 caliber armor-piercing, incendiary, SLAP, or Raufoss ammunition can only be described as frightening. Yet all of these types of ammunition are available on the U.S. civilian market. SLAP is less frequently offered than ball, armor-piercing, and incendiary variants, and Raufoss is rarely offered publicly. Nevertheless, the VPC has documented public offerings and apparent sales in the civilian market of all the varieties discussed above.

Section Two:
The Threat of the 50 Caliber Anti-Armor Sniper Rifle to Aviation Targets

The accuracy of the Model 82A1 makes possible the placement of the shot in the most vulnerable area of the target. The compressor sections of jet engines or the transmissions of helicopters are likely targets for the weapon, making it capable of destroying multi-million dollar aircraft with a single hit delivered to a vital area.

—Barrett Firearms Manufacturing Inc. brochure advertising its Model 82A1 50 caliber sniper rifle

Today's civil aviation system is a prime target for terrorism, and 50 caliber anti-armor sniper rifles are an ideal tool for terrorist attacks on airplanes, helicopters, their attendant fuel trucks, tank farms, and airport facilities, including control towers.

The first terrorist mid-air bombing of an airliner took place in 1949.³⁰ But terrorists did not begin to target civil aviation intensively until the mid 1960s—the first armed assault on an airliner took place in June 1968, and the first terrorist hijacking for political extortion in July 1968.³¹ Although the number of attacks on airliners peaked in the 1980s and has declined since then, the number of casualties has steadily increased (even excepting the catastrophic consequences of September 11, 2001).³² In other words, terrorist attacks on civil aviation have become more and more deadly over the last four decades.

Terrorism experts have noted two important facts about terrorism and aviation security that are directly relevant to the threat of 50 caliber anti-armor sniper rifles.

First, when authorities put terrorism countermeasures into place, terrorists develop new techniques to overcome them. For example, when metal detectors made it more difficult to carry guns onto airplanes, hijackers began blowing airplanes up.³³ A fatal shooting at an El Al ticket counter in the Los Angeles airport on July 4 this year ignited discussion of the same phenomenon by politicians and security officials, leading to the observation by terrorism expert Brian Jenkins, "To protect the airport itself, one has to decide where you draw the security line."³⁴

Second, security officials have consistently failed to anticipate new forms of terrorist attack on aviation. One authoritative study of terrorism and commercial aviation concluded, "A look at the history of attacks on commercial aviation reveals that new terrorist methods of attack have virtually never been foreseen by security

authorities...the terrorists have not been torpid. They have looked for new ways to circumvent the security system."³⁵

Both of these facts underscore the danger of attack by terrorists using 50 caliber anti-armor sniper rifles. As authorities strengthen screening aimed at passengers, visitors, explosives, and firearms, the security perimeter is pushed out from the terminal. Terrorists will look for ways to attack from beyond the expanded perimeter. Thus, the 2,000 yard effective range of the 50 caliber sniper rifle becomes painfully relevant, because it is an easily obtained weapon to attack with great effect from beyond the security perimeter. As Barrett Firearms Manufacturing itself states in a promotional brochure, its 50 caliber anti-armor sniper rifle "has the ability to engage the enemy at ranges far beyond those at which small arms can return fire."³⁶

True to form, the nation's principal civil security officials remain at best uninformed and at worse indifferent to this obvious and potentially devastating new terrorist method that fits the bill perfectly—the 50 caliber anti-armor sniper rifle.^h

Specifically Designed to Destroy Aircraft and Helicopters

The 50 caliber anti-armor sniper rifle was designed in large part specifically to destroy aircraft from long range, beyond a security perimeter. Thus, gun expert Ian V. Hoggⁱ described the weapon's initial reception:

The Barrett company were the first to introduce a production .50 sniping rifle, when this weapon appeared in 1983. There was a good deal of scepticism at the thought of using such a heavy weapon for sniping but, after Barrett pointed out that the object was to wreck several

^h The Violence Policy Center sent copies of its earlier report, *Voting from the Rooftops*, to dozens of senior government officials when the report was first released. More recently, copies were sent with detailed cover letters to Attorney General John Ashcroft on May 28, 2002, and to FBI Director Robert S. Mueller, III on May 29, 2002. To date, neither Messrs. Ashcroft and Mueller, nor any other official charged with counter-terrorism in general or aviation security in particular, has evidenced any concern about the tangible terrorism threat posed by the 50 caliber anti-armor sniper rifle.

ⁱ Hogg served 27 years in the British Army's Royal Artillery, the final six as Regimental Sergeant Major and instructor in ammunition and ordnance at the Royal Military College. Retiring as a Master Gunner, he was subsequently editor of *Jane's Infantry Weapons* for 22 years, and has authored or edited more than 140 books. Ian V. Hogg and John S. Weeks, *Military Small Arms of the 20th Century (7th Edition)* (Krause Publications, Wisconsin, 2000), back cover. The National Rifle Association describes him as "acclaimed" in its promotion of *Military Small Arms* on its Internet web site. See, <http://store.nrahq.org>, downloaded July 31, 2002.

million dollars' worth of jet aircraft with one or two dollars' worth of cartridge, the whole thing began to make more sense and the idea spread.³⁷

Hogg's description is borne out by early Barrett promotional material that directly stated the new anti-armor rifle's usefulness against aviation targets. For example, an undated brochure (apparently, however, from about 1984), obtained from the firm's ATF licensing file states:

The Model 82A1 is designed to provide extreme accuracy at extended ranges with standard military ammunition....The accuracy of the Model 82A1 makes possible the placement of the shot in the most vulnerable area of the target. The compressor sections of jet engines or the transmissions of helicopters are likely targets for the weapon, making it capable of destroying multi-million dollar aircraft with a single hit delivered to a vital area. The cost-effectiveness of the Model 82A1 cannot be overemphasized when a round of ammunition purchased for less than 10 USD can be used to destroy or disable a modern jet aircraft.³⁸

The same brochure boasts that the accuracy of the 50 caliber sniper rifle "enables it to place more rounds on target in the same time than the M2HB [machine gun] firing full automatic while expending approximately one third of the ammunition."³⁹ Inventor and manufacturer Ronnie G. Barrett elaborated on these capabilities of his company's 50 caliber anti-armor sniper rifle more recently in sworn testimony during a 1999 federal criminal trial.^j He testified that a shooter could empty the rifle's standard 10-round magazine in less than one minute—even taking the time to regain a sight picture of the target after every shot, the shooter would take only about three to four seconds between each shot, and thus could empty the magazine in 30 seconds or less. Two snipers firing simultaneously could, he testified, fire more rounds in a "much shorter" period of time.⁴⁰

Barrett also testified that at a distance of 1,000 yards (10 football fields) the 50 caliber anti-armor sniper rifle could penetrate the fuselage, engines, and cockpit windows of a commercial aircraft.⁴¹

Other manufacturers have made similar anti-aircraft claims for their 50 caliber

^j It is interesting to note the anomaly that all machine guns are currently strictly regulated under the federal National Firearms Act, but the 50 caliber sniper rifle—that Barrett claims can deliver more accurate fire over long range than the 50 BMG machine gun—is not subject to the NFA.

weapons. For example, EDM Arms developed its Windrunner 50 caliber sniper rifle as an entrant in a U.S. Army competition for a new generation rifle termed the XM-107.⁴² The Army specifications for the new rifle—posted on EDM Arms’ web site—required it to be able to: “Attack various materiel targets such as parked aircraft....”⁴³ Although Barrett won the Army competition, E.D.M. states that its Windrunner model is “tactically superior to the Barrett XM-107.”⁴⁴

Tromix Corp., the manufacturer of the 50 AE AR-15—a hybrid form of 50 caliber rifle less powerful than the 50 BMG sniper rifle^k—went so far as to publish photographs documenting a ballistic test that allegedly proved the capability of the round to penetrate the cockpit windshield of a McDonnell Douglas DC-9 jet airliner.⁴⁵

Bombs on the Ground—Aircraft and Aviation Facilities

Given the capabilities of the 50 caliber anti-armor sniper rifle, and its designers’ intent that aircraft and associated facilities be among its primary targets, it is no surprise that a 1995 RAND report identified 50 caliber sniper rifles as a serious threat against the security of U.S. Air Force bases.⁴⁶ After noting the success of Barrett sniper rifles with Raufoss bullets against light armored vehicles in the 1991 Gulf War (discussed in Section One), the authors noted:

Such weapons also give light forces a portable and quite deadly option against parked aircraft....These rifles are effective against man-sized targets up to 1,600 meters away and could hit aircraft-sized targets at even greater ranges; one expert marksman has reported consistently hitting 8-X-10-foot targets over 2 kilometers distant. Further improvements are undoubtedly on the way....The Barrett’s popularity appears to be spreading beyond the 17 countries that now use it. It seems only a matter of time before these or similar weapons find their way into the arsenals of potential adversaries, if they have not already done so.⁴⁷

^k Tromix has since apparently gone out of business. “Looking for Tromix?,” notice published on Teppo Jutsu LLC Internet web site, downloaded from <http://www.teppojutsu.com/newpage12.htm> on August 20, 2002. The 50 Action Express (.50AE) ammunition that the Tromix rifle fired was originally developed as a handgun round and, despite its claimed impressive performance against aircraft cockpit windows, is nonetheless considerably less powerful than the 50 BMG round fired by the anti-armor sniper rifles with which this report deals. See ballistics tables (muzzle energy in ft. lbs.) in Ken Ramage (ed.), *Gun Digest 2003* (Krause Publications, Iola, WI, 2002), pp. 226, 229, for 50 BMG and 50 AE.

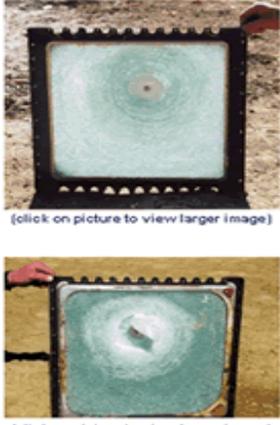
BALLISTICS TESTING

50 ACTION EXPRESS

At Tromix we believe that the proof is in the pudding. So we took the 50AE AR-15 to the range to make some pudding out of some fairly formidable targets.

The McDonald Douglas DC-9 center cockpit windshield. Designed with 2in. thick glass in a 3 ply laminate. These windshields were designed to take what ever the elements can throw at it. Imagine hail at 30,000ft going over 500 miles an hour. It is a good thing Mother Nature doesn't pack the 50AE.

By the way, the .223 mouse gun didn't even penetrate the windshield.



(click on picture to view larger image)

(click on picture to view larger image)

The manufacturer of a “hybrid” 50 caliber sniper rifle published this ad purporting to show the gun’s ability to blast through aircraft windshields. The caliber round fired by the Tromix model, .50AE, was developed as a pistol round. It is much less powerful than the .50BMG rifle round used by the sniper rifles discussed in this report. Unfortunately, the more powerful 50BMG is also much more common than the 50AE rifle hybrid.



A 50 caliber sniper rifle attack against a civilian airfield using armor-piercing, incendiary ammunition—freely available on the civilian market—could set off a series of fratricidal explosions, as the fireball from one aircraft ignited another close to it. A book on 50 caliber sniper rifles published by a former U.S. Army officer describes in detail how a sniper mission would be carried out against parked military aircraft. The description includes drawing and diagrams. The book has received wide praise

from within the sniper enthusiast community.

This scenario of a terrorist attack with 50 caliber anti-armor sniper rifles is exactly that quoted from the Air Force's official magazine, *Airman*, in the introductory section to this report. And we now know that Barrett 50 caliber sniper rifles had in fact already made their way into the arsenal of at least one real adversary—al Qaeda—even before the RAND report was written. In other words, all of the elements of a potential terrorist attack against aviation targets, as warned by RAND and portrayed by the Air Force in its official magazine, are in place.

In light of the .50's capabilities, the RAND report's description of the variety of targets at a typical air base is quite sobering when one realizes that similar targets are plentiful, and much less well-defended, at any civilian airfield:

An air base is a classic "target-rich environment." Besides the aircraft themselves, air bases offer fuel-storage facilities, munitions bunkers, the control tower and operations center, navigation aids, crew housing, maintenance facilities, and aerospace ground equipment....Fuel storage has proven to be particularly vulnerable to attack. Storage tanks are large, thin-skinned targets that, for routine safety purposes, are often placed on the base periphery. This location, however, exposes them to attack from direct-fire weapons....off-base tank farms are generally even more vulnerable than fuel-storage sites on-base.⁴⁸

Putting aside the terrorist threat to U.S. military air bases at home and abroad,¹ it takes no imagination to project the identical threat to civilian airports. They too have all the targets of air bases (except munitions bunkers). It is clearly possible to shoot down some aircraft at certain points of flight, a subject discussed below. But the gravest threat of attack may well be the simpler and easier scenario described in *Airman*—turning aircraft and fuel trucks into enormous bombs by striking them at long range with incendiary or explosive 50 caliber ammunition.

In light of the September 11 attacks, the concept of jetliners being turned into bombs is no longer a foreign idea. As the publisher of a jet-fuel industry newsletter recently observed, if a commercial jet can be turned into a bomb in the air, "It's also a bomb sitting on the runway and...at the terminal."⁴⁹ A Boeing 747-400 has a maximum fuel capacity of 57,285 gallons.⁵⁰

There are many such potential aviation targets in the United States. According

¹ As noted in the *Airman* article quoted in the Introduction, the Air Force, if not civil aviation, has taken the threat seriously and is conducting countersniper training for its base security forces. See also, U.S. Force release, "Cops Graduate from Second Countersniper School," 17 August 2001, quoted in *Regulatory Intelligence Data*.

to the Federal Aviation Administration, in 2000 there were 651 airports in the United States “certificated” to handle air carriers with aircraft seating more than 30 passengers—of these, 563 airports were civilian and 88 military.⁵¹ There are an average of 35,000 flights per day, and an average of 100 people on board those flights.⁵² The number of potential passenger casualties from an explosion caused by a sniper attack on a single fully loaded jet could be as high as 550 in the case of a Boeing 777-300, for example.⁵³ This is wholly aside from the fratricidal effects of one aircraft exploding and setting fire to another, or attacks by multiple snipers on more than one aircraft.

It is therefore quite clear that an attack by one or more terrorist snipers, using destructive power as powerful as, but much more easily available and cheaper than, bomb materials or rockets potentially could devastate a commercial airfield in a matter of seconds.

The danger for national security policy and commercial aviation security is that many lay persons—including aviation industry experts themselves—are uninformed about the 50 caliber anti-armor sniper rifle’s powerful reach, and continue to think of airport security simply in terms of keeping unauthorized personnel away from the immediate area.⁵⁴ This is, of course, important. But those concerned about security should extend their vision to the 50 caliber sniper rifle, its enormous range, and its unique capability to turn aircraft and fuel trucks into bombs on the ground.

Aircraft in Flight

Equally disturbing as a ground attack is the question of whether a sniper with a 50 caliber anti-armor sniper rifle can down an aircraft while it is in flight. The answer depends on both the type of aircraft and the moment of its flight, i.e., whether it is hovering, taking off or landing, or fully airborne. Nevertheless, it can be done, and it can surely be done under the right circumstances by a sniper or team of snipers with 50 caliber anti-armor rifles.

Shooting down an aircraft with small arms fire is clearly possible. The U.S. Army specifically includes the possibility of downing attacking aircraft with small arms fire in its war manuals. For example, one field manual states:

Small arms fire against aerial platforms can be effective. A quick review of the record shows this to be true. In the Korean War, our Air Force lost 259 jet aircraft and 285 other aircraft to combined small arms and air defense fire, which is nearly five times as many aircraft that [sic] were lost in air-to-air combat. In South Vietnam, we lost 410 fixed-wing aircraft and 2,100 helicopters.⁵⁵

Another Army manual states unequivocally: "An individual soldier firing a rifle or a machine gun can achieve hits on an enemy aircraft when he leads the target."⁵⁶ A newsletter published by the Center for Army Lessons Learned at Ft. Leavenworth, Kansas, likewise states, "Coordinated fire from small arms is effective against enemy aircraft."⁵⁷

Nevertheless, it is obvious that striking an aircraft in flight is a matter of time and place, and therefore the risk is one of degree.

Helicopters are certainly vulnerable to 50 caliber sniper rifle fire. The U.S. Army, for example, notes that as of 1984 the Afghan Mujahideen resistance fighters "were credited with shooting down close to 300 Soviet helicopters using small arms and anti-tank weapons."⁵⁸ It should be noted that this record was achieved against military helicopters, many of which are armored, and before the United States began supplying the thoroughly effective Stinger ground-to-air missile to the Mujahideen.

The 50 caliber anti-armor sniper rifle represents a serious threat to helicopters. In fact, the Barrett Internet web site includes a posting of a 1994 article about the company that states that one Barrett model, the M82A2 "bullpup" design, was "conceived in 1987, reportedly for use against helicopters in Afghanistan."⁵⁹ The fact that this particular model was designed to be fired from the shoulder, as opposed from a prone position, lends credence to that theory.⁶⁰ Although the M82A2 is no longer in production, Barrett manufactures a similar bullpup model, the M95. The company's Internet web site description of the model M95 includes a downloadable video in which a shooter demonstrates rapidly firing the Model 90, an earlier version of the current Model 95, from the shoulder.⁶¹

The vulnerability to 50 caliber sniper fire of other aircraft in flight depends on a number of factors, including altitude, speed, and angle with respect to the sniper. Aircraft landing are particularly vulnerable, as illustrated by the testimony of Ronnie G. Barrett as a government expert witness during a 1999 criminal trial. On cross-examination, Barrett was interrogated about the relative difficulty of hitting a stationary target and a moving target, such as a motorcycle or an airplane. Asked whether it was harder to shoot an airplane "coming in to land...descending over 120 miles an hour" he testified:

If it is coming directly at you, it is almost as easy. Just like bird hunting. But yes, it is more difficult if it is horizontally, or moving from left to right, yes.⁶²

In other words, according to Barrett, shooting at a moving object coming directly at one is "almost as easy" as a stationary target, an answer that is consistent with detailed instructions given in various Army manuals about engaging aircraft with

small arms.

Barrett was also asked whether having two rifles in different positions increased the chances of striking any given target, to which he replied, "By twice, I would say, yes."⁶³

Available Instruction in Ground and Air Attacks on Aviation

It is not difficult to find materials that describe precisely how to attack aircraft with 50 caliber anti-armor sniper rifles.

The military manuals cited in the preceding section can be easily found on official U.S. Army Internet web sites (and often elsewhere) by a routine search. However, at least two other books—both available from major book distributors—written by former military snipers provide even more specific advice about attacking aircraft. One provides a diagram of the most vulnerable points to attack on a helicopter with a sniper rifle. Another lays out a complete "mission" to attack aircraft and accompanying materiel on the ground.

Section Three: Lessening the Risk

Fifty caliber anti-armor sniper rifles are a dire threat to civil aviation, as serious as rockets and mortars. Yet many who are responsible for aviation security know little or nothing about guns, much less the 50 caliber sniper rifle. Although some government and industry officials are becoming more educated to the threat of the 50 caliber sniper rifle, much broader education of policymakers, news media, and security specialists needs to be undertaken. This report aims at that goal.

Aviation security officials generally concentrate on filtering access to aircraft and building layers of close-in security to keep dangerous people and weapons away from aircraft and terminals. Certainly this strategy has merit as far as it goes. But, as this report demonstrates, the threat of the 50 caliber as a tool of terror extends far beyond these perimeters. What is also needed is a comprehensive strategy for dealing with the deadly consequences that are certain to follow in the wake of the gun industry's cynical campaign to market weapons of war like the 50 caliber sniper rifle to civilians.

Add 50 Caliber Sniper Rifles to the National Firearms Act of 1934

Congress should immediately amend federal law to bring 50 caliber sniper rifles under the National Firearms Act of 1934. Legislation to accomplish this has been introduced in the U.S. House and Senate (H.R. 3182 and S. 505). This action would subject these weapons to the same regimen of registration, background checks, and taxation to which other weapons of war, such as machine guns and destructive devices, are currently subjected.

Ideally, there should be no "grandfathering" of existing weapons to exempt them from the law, and any grace period for registration should be very short. America must know who besides Osama bin Laden has obtained these deadly tools of assassination and terror.

Permanently Ban Export of 50 Caliber Sniper Rifles to Civilians

The President may not need to wait for Congress to take action on this point. He should immediately order the Department of State to review whether export of these weapons to civilians should be allowed under existing restrictions on export of weapons. If the Department finds that 50 caliber sniper rifles should not be allowed under existing restrictions, the President should call for a permanent export ban.

Clearly it is not in the interest of America's national security to allow any more 50 caliber sniper rifles to end up in the hands of international terrorists, drug lords, or common criminals. Likewise, the federal Bureau of Alcohol, Tobacco and Firearms (ATF) should prohibit any future importation of 50 caliber sniper rifles. ATF can do this by exercising its authority to exclude from the United States firearms that are not particularly suitable for sporting purposes.

Improve Reporting and Recordkeeping Requirements

Under current procedures, the Bureau of Alcohol, Tobacco and Firearms cannot state with certainty how many 50 caliber rifles have been manufactured in the United States. Moreover, the minimum reporting requirements that apply to firearm manufacturers do not even include the reporting of model numbers.

Likewise, information regarding how many of these sniper rifles have been used in crime is extremely limited. ATF keeps track of how many times local police departments request that such weapons be traced. However, no information regarding the police department requesting the trace or the type of crime with which the weapon was associated is available.

This type of information is essential to be able to assess the level of threat posed by these weapons. ATF should immediately revamp its reporting standards to require that the manufacturers of sniper rifles report the exact number of such weapons produced each year, including the caliber and model designation, and the identity of any person to whom the weapon has been transferred by the manufacturer.

ATF should also enhance the collection, analysis, and dissemination of tracing data related to all sniper rifles. Specifically, ATF should collect and make available to the public information regarding the frequency of the use of such weapons in crime, including the nature of those crimes.

Use the Civil Justice System to Hold Manufacturers Accountable

The marketing of 50 caliber sniper rifles presents a classic case, using ordinary "black letter" tort concepts, of an industry's calculated decision to sell without restraint unnecessarily powerful weapons of war as "toys"—in reckless disregard of clearly foreseeable consequences stemming from the intended and advertised use of the product.

Given their acknowledged design purpose, 50 caliber sniper rifles are clearly *qualitatively* different from any other class of firearm. Other firearms sold in the civilian market are at least nominally designed and sold for sporting or supposed self-defense purposes. Fifty caliber sniper rifles, on the other hand, are designed and sold for the express purpose of killing people and destroying property. Civil courts should be prepared to recognize this fact.

Therefore, a useful strategy for effective control may lie in civil litigation, a strategy that would be enhanced if states passed legislation clearly establishing strict liability for damages resulting from the use or misuse of such weapons. Such litigation could impose tort liability, including punitive damages, for manufacturers, wholesalers, distributors, importers, retailers, and any others who participate in bringing to the civilian market any 50 caliber sniper rifle or associated gear (such as ammunition or optics) that is used to kill or injure a human being or to damage property.

In short, the gun industry should be held to the strictest standards of legal accountability available for the design and marketing to civilians of 50 caliber sniper rifles, as detailed in this report.

Ban the Sale of Armor-Piercing Ammunition

Military surplus armor-piercing (AP) and armor-piercing incendiary (API) ammunition for 50 caliber sniper rifles is widely and readily available. Although Congress has banned the manufacture of some armor-piercing ammunition, those restrictions apply only to handgun ammunition. The existing ban on armor-piercing ammunition should be updated and expanded to cover all AP and API ammunition. This would most effectively be accomplished through the promulgation of a performance standard in which ammunition is tested for its ability to *penetrate* bullet-resistant vests, ballistic glass, and armor,^m as opposed to the existing standard based on the bullet's *content*.

Enact Comprehensive Health and Safety Regulation of the Gun Industry

Taken together, the foregoing recommendations would significantly reduce the severe and immediate threat that 50 caliber sniper rifles pose to public safety and national security. But on a broader level, the marketing of 50 caliber sniper rifles to

^m The current definition of armor-piercing ammunition is based on the materials employed in the construction of the projectile and the relative weight of the projectile jacket. See 18 U.S.C. § 921 (a)(17)(B) and (C).

civilians simply highlights the chronic problems that stem from the lack of comprehensive health and safety regulation of the firearms industry.

As the gun industry markets each new deadly innovation, public policy typically responds on a reactive, piecemeal basis. This must change if we are to keep up with the industry's consistent and deadly ingenuity. *The gun industry must be subject to the same type of regulation that already applies to virtually every other industry in America.* The gun industry is currently exempt from even the most basic consumer health and safety laws.

Congress should act on legislation introduced by Senator Robert Torricelli (D-NJ) and Representative Patrick Kennedy (D-RI), the Firearms Safety and Consumer Protection Act. The bill would vest the Department of the Treasury with strong consumer protection authority to regulate the design, manufacture, and distribution of firearms and ammunition. The agency would be empowered to take the steps necessary to protect the public from *unreasonable* risk of injury resulting from the use of firearms or firearm products. The agency would be able to set minimum safety standards for firearms and ammunition, issue recalls, mandate safety warnings and, in extreme circumstances, ban certain models or classes of weapons.

This legislation would end the gun industry's deadly immunity from regulation and permit the Department of the Treasury to respond immediately to new threats to public safety such as 50 caliber sniper rifles.

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