

The Art of Strafing

By Richard B.H. Lewis

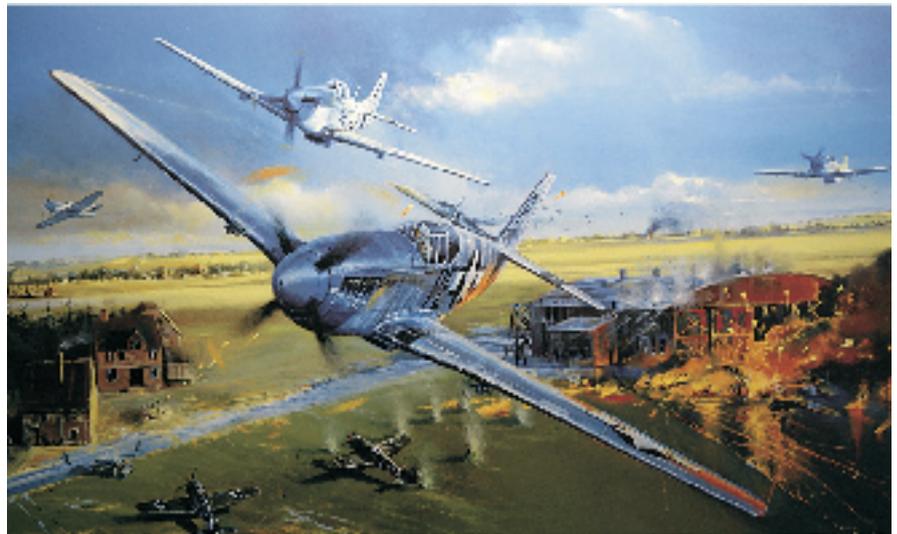
MODERN fighter pilots risk their lives every day performing the act of strafing, which to some may seem like a tactic from a bygone era. Last November, an F-16 pilot, Maj. Troy L. Gilbert, died strafing the enemy in Iraq, trying to protect coalition forces taking fire on the ground. My first thought was, “Why was an F-16 doing that mission?” But I already knew the answer.

In the 1980s, at the height of the Cold War, I was combat-ready in the 512th Fighter Squadron, an F-16 unit at Ramstein AB, Germany. We had to maintain combat status in air-to-air, air-to-ground, and nuclear strike operations. We practiced strafing occasionally. We were not very good at it, but it was extremely challenging. There is a big difference between flying at 25,000 feet where you have plenty of room to maneuver and you can barely see a target, and at 200 feet, where the ground is rushing right below you and you can read the billboards screaming by.

The only aircraft required to strafe in the Cold War was the A-10, and for good reason. It was the only aircraft built to endure the hazards of strafing against Warsaw Pact forces. We have all seen aircraft in the movies, diving at the ground, guns blazing, while people on the ground are running to take cover. That’s not how it really is. Once the fighter enters the low-altitude environment, the pilot is subject to multiple threats; he faces not only surface-to-air missiles and anti-aircraft artillery but also handheld heat-seeking missiles and automatic gunfire.

In “No Man’s Land”—that is, below 5,000 feet—the chances of being hit go up astronomically. However, for many aircraft, the limitations of the gun require the pilot to fly lower, below 1,000 feet, if he or she hopes to consistently hit the target. When you get down that low, bad things can happen.

The Pentagon defines strafing simply as “the delivery of automatic weapons fire by aircraft on ground targets.” The term itself has an interesting pedigree. It is derived from the German word “strafen,” meaning, “to punish.” In World War I, a popular German Army catch phrase



Painting by Robert Bailey

was “Gott strafe England” (“God punish England”). The term caught on.

In the World War I Battle of St. Mihiel, Capt. Eddie Rickenbacker once strafed eight German artillery pieces, each drawn by a team of six horses. Horses and wagons scattered everywhere, the great pilot later recounted. The physical damage was not great, but the disruption of the horse train worked.

Among World War II strafing aircraft, few if any were more effective than the American B-25 Mitchell bomber. In the Pacific, it was used frequently on treetop-level missions against Japanese airfields and shipping, with great impact. In both World War II and the Korean War, 12.7 mm guns were the real workhorses. The 20 mm gun has been the weapon of choice for most US fighters over the past 50 years. Its key attributes have been its high rates of fire and muzzle velocity.

During the Vietnam War, we lost large numbers of aircraft, many as a result of getting down low and in the range of lethal fire. This made it a priority to build a ground attack aircraft dedicated to close air support.

The design of the A-10 is unlike any other aircraft. It was built with unparalleled emphasis on simplicity and survivability. For instance, it features a titanium “bathtub” to protect the pilot from direct hits from armor-piercing and high-explosive projectiles in sizes up to 23 mm. Beyond that, it has redundant

flight controls and a 30 mm Gatling gun. I have seen the aircraft return from combat with one engine and major parts of a wing and flight controls blown off. Unquestionably, the A-10 is the ultimate strafing machine.

Strafing in other fighter aircraft, though done more and more often, is extremely dangerous. To be effective on the battlefield, a pilot must be able to perform low-altitude passes in the face of the enemy. Each party is blazing away at the other. In fighter aircraft other than the A-10, the pilot must make very low passes if he is to deliver accurate fire from the gun. Doing this, though it might sound easy, requires intense concentration. This is critical if the pilot is to avoid flying through the up-thrown debris from exploding targets or flying into ground objects.

For most fighter pilots, strafing well in combat is no simple task. Holding wings level while tracking a target for more than 10 seconds is considered too predictable for enemy fire. One has to visualize the point in the battlespace where one needs to be to start the strafing pass, and yet still maintain awareness of the target’s location. This dual task can best be carried out using a five- to 15-degree dive angle. Altitude, airspeed, and wind direction must also be considered.

Imagine yourself flying down a large funnel that ends at the target. One finds lots of room to maneuver at the top of

the funnel; you can do that and still hit the target. However, at the bottom of the funnel, you run out of maneuver room. One needs to place the aircraft's aiming symbology short of the target such that it drifts up to the target as the gun comes within firing range. It is difficult to keep the gun sight on the target for more than two seconds while flying at 552 mph. One can't just stare, zombie-like, at the target. This causes target fixation, which can become a fatal experience.

We know from Gilbert's death what such concentration can cause. (See "Aerospace World: F-16 Pilot Awarded the DFC," June, p. 14.) The official accident report blamed the accident on Gilbert's "channelized attention," which was "manifested by his desire to maintain a constant visual positive identification of targeted enemy vehicles, and subsequent target fixation on these vehicles." These circumstances, the report went on, caused the F-16 pilot "to begin and then press his attack below a recoverable altitude." On Gilbert's second strafing pass, he came in at an extremely low altitude and simply could not recover. He flew the airplane into the ground.

Then there is the risk of being brought down by the "Golden BB"—the single, lucky but lethal shot that finds its mark. That risk exists for virtually any fighter whose cockpit can be easily penetrated by ground fire. That is why, after the pilot has strafed the target, he pulls up hard. A wings-level pullout, producing at least four Gs in two seconds, is required for survival in most cases.

We're using the gun quite a bit in the Iraq and Afghanistan operations. The fighters are using lots of 20 mm off F-15Es and F-16s and 30 mm off A-10s to hit ground targets. Why is that? For individuals, the gun is probably one of the most accurate weapons, with the least collateral damage. That 20 mm will end the bad guy's life, but stray rounds will just drive into the ground, and that's it.

In Iraq, the adversary uses both road networks and riverine networks. There have been a number of occasions where boats have been identified carrying insurgents on the Tigris and Euphrates Rivers, and we've used 20 mm and 30 mm guns to destroy those boats. A moving target is hard to hit with a bomb. With a gun, it's no big deal. In one instance, the enemy was getting ready to move people somewhere to do something later that night, but we removed them from the fight.

The same thing happened in Balad, where we found people going to get roadside bomb supplies. We have been using the gun against single persons who have been planting improvised explosive devices. You'll have an individual with a truck, and a couple of other individuals; you'll see them get out and move around, trying to dig a hole, and you'll bring in an F-16 or an F-15E, or maybe an A-10, and you'll use 20 or 30 mm and go kill them. If you have troops in contact, or you have individuals in buildings, you do the same thing.

Some pilots are expanding the strafing envelope, so to speak. Earlier this year, the Secretary of the Air Force, Michael W. Wynne, told this story: "About a year ago, our F-15 airmen were thinking about how they could execute night strafing. It seemed hard, maybe undoable. Last month, I learned it was being done in daily ops in the fight. ... Actually, it is now called easy." The F-15 community had programmed F-15 simulators at Seymour Johnson AFB, N.C., where

"Enemy troops 75 meters away. ... I need guns only!"

you could, through practice, work a night strafe from "hard" to "easy" in a matter of months.

A-10s probably will be here until they fall out of the sky, but can they always get the job done when our ground troops call 911? They cannot be all places, all the time. The A-10 will sometimes be too slow to respond across large areas and it is vulnerable to SAMs and enemy fighters. That is why all of USAF's fighters now train for strafing. Often, our ground troops are in desperate situations and are so close to the enemy they are in danger of being hit by friendly weapons. In Operation Anaconda in Afghanistan, for instance, USAF combat controller SSgt. Gabriel Brown, under fire, called out to approaching F-15E pilots, "We have enemy troops 75 meters away. ... I need guns only!" (See "The Airpower of Anaconda," September 2002, p. 60.)

I don't see the F-22 doing much strafing; its mission is to hit the targets in denied airspace at strategic locations in front of our ground troops. Its gun is optimized to shoot down enemy aircraft. Usually the gun is needed for air-to-air combat because you are inside the minimum range of an air-to-air missile or it is the only weapon left. In the development of the F-22, there was a

debate about whether we should take out that gun. I'm glad we didn't, because, in combat trials, we have already had gun kills. The gun was required to complete the mission.

Even so, the F-22, like all other fighters, can strafe when it has to. And it will probably have to. Few would have thought, 20 years ago, that the F-15E would one day play the role of classic strafing machine. Yet the Strike Eagle did a great job strafing al Qaeda fighters during the March 2002 battle on Takur Ghar, one of the main engagements of Anaconda. Of course, it should be noted that the F-15E pilot had long, deep experience flying the A-10.

The F-35 Lightning II fighter, which is set to enter service in 2013, has a special gun, better for strafing ground targets than the gun found in the F-22. The F-35 is specifically designed to have the sensors and weapons needed to support ground operations. It will go deep, but it will also thrive in CAS engagements. Its gun will carry special shells powerful enough to penetrate armored targets, unlike the F-22, whose gun ammo is specially designed to blow up an airplane. The F-35's gun will be a weapon of last resort, though, because of the extreme vulnerability of the pilot during a strafing mission.

With the advent of small, low-collateral-damage weapons, the tactic of strafing may well begin to fade out once more. Weapons boasting 10-foot accuracy allow a pilot to reliably drop ordnance close to our troops, but with scant risk of fratricide. Such weapons can get much closer to a target than is the case with strafing. These weapons could fill the strafing niche.

Of course, strafing often happens for fighters like the F-16 when A-10s are not available or when all other ordnance has been expended. There will always be a possibility that you have to protect that guy on the ground with your last bullet. That part of the job will never completely disappear. ■

Richard B.H. Lewis recently retired as an Air Force major general. He flew the F-4, F-16, and F-111, and served as assistant to the director of campaign plans during Operation Desert Storm. In the period 2002-06, he was program executive officer for the F-22 fighter. He is now an executive of Burdeshaw Associates Ltd. This is his first article for Air Force Magazine.