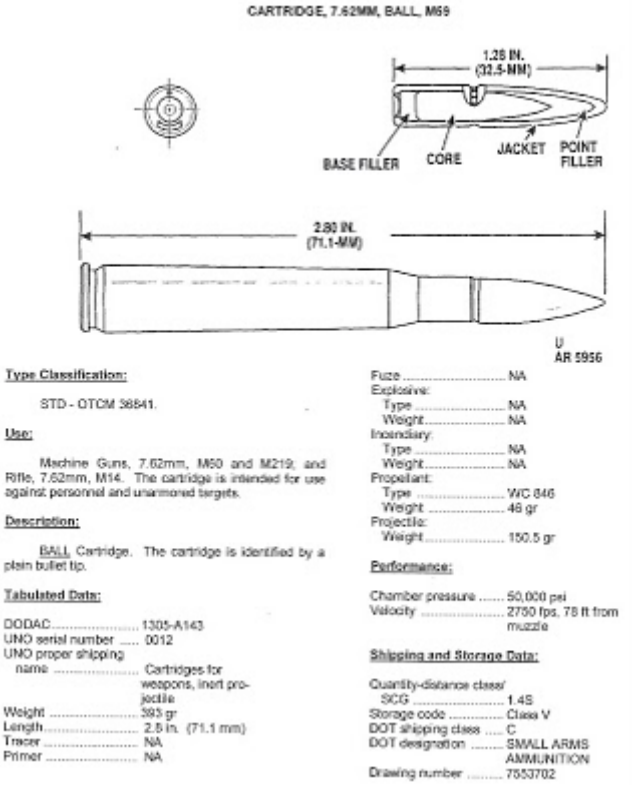
GETTING THE MOST OUT OF THE BATTLE RIFLE. PART I: AMMUNITION

If think everyone by this point knows my take on the assault rifle vs. battle rifle deal. I think the easiest way to increase the performance of your rifle is to simply increase the size of the hole in the skinny end. In addition, there is also a variety of special ammunition available (some more available than others) that can increase the usefulness and performance of a battle rifle.



BALL

Even the Plain-Jane old full metal jacket ball rounds will perform pretty well penetration-wise. Just the standard M-80 147-grain Full Metal Jacket round in 7.62mm has quite a bit of penetrative power, even though it was designed as an anti-personnel round with a relatively soft lead core and dates back to 1953. It can penetrate a 3.45mm standard NATO steel plate at 620 meters, which is also listed as its maximum effective range, although snipers have successfully used the .308 to ranges of 1,000 meters.

A WWII training video I have shows the old .30-06 ball round from an M1 Garand punching through a 12-inch oak tree with enough power to explode a bucket of water upon exiting. I once packed a line of 1-inch soft pine board ends 48 inches thick and put .30-06 ball rounds through the whole shebang. The .308 ball rounds did not quite make it through the whole stack, but came within a few inches.

Still, penetrating forty inches of wood isn't too awful bad. Ian Rhodes, veteran of the Rhodesian Light Infantry, certainly appreciated the penetration of the 7.62x51mm round, as did his fellow soldiers.

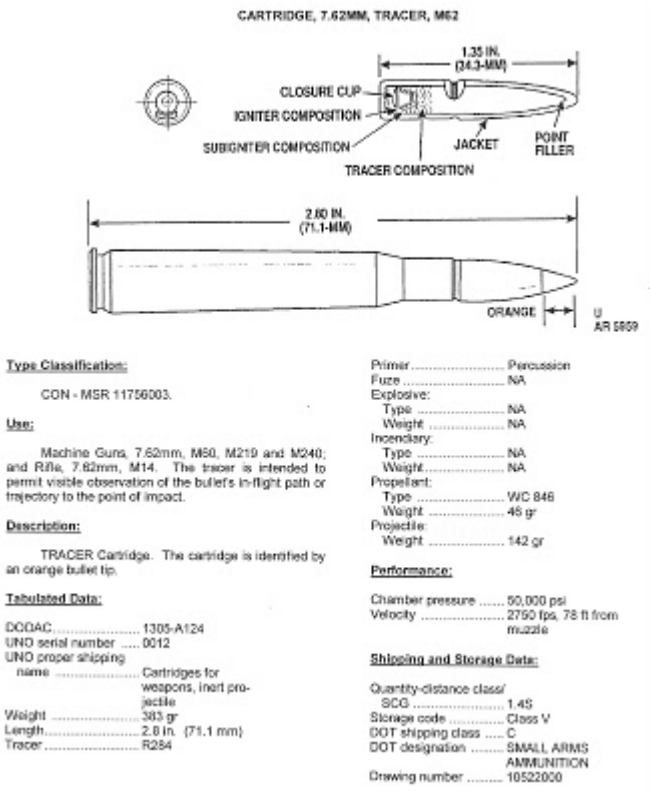
"FAL 7.62 long rounds [7.62x51mm NATO] have the power to punch through the tree trunks generally found in the African savanna and jesse bush! AK47`s using 7.62 short [7.62x39mm], on the other hand, generally did not. This fact was used to great effect by the Rhodesians. When firing into an area that included trees, rocks or ant hills etc, a single round down the left hand side of a solid object was good practice (not forgetting most opponents are right handed), then double tap the base of the tree and continue to the right, squeezing off single (or double) rounds in fairly close proximity (In a conventional situation, moving from left to right takes out the trigger man before the machinegun loader or second.) Smallish rocks, strange "lumps", or "bundles of rags" were to be killed. In fact anything out of place was to be dealt with - the "rocks" may be heads, hands, or a pattern on a camouflage uniform etc. The soldier then moved his aim to the next area of cover and repeated the process."

Before they let him play with tanks in the desert, Erwin Rommel cut his tactical teeth as a light infantry lieutenant in the elite mountain troops fighting in the First World War. His first battles, however, were with the French. Here he noted what a "mere" bolt-action rifle with an 8mm hole in the end can do.

"The enemy was withdrawing from the fire of our guns which were sweeping the highest portion of the ridge…I estimated that about a hundred Frenchmen were coming straight at us in column of files. Not one of them lifted his head above the grain. Was I to call up the remainder of the platoon? No! They could give us better support from their present position. The penetration effect of our rifle ammunition came to mind! Two or three men at this distance! I fired quickly at the head of the column from a standing position. The column dispersed into the field; then, after a few moments, it continued the march in the same direction and in the same formation. Not a single Frenchman raised his head to locate this new enemy who had appeared so suddenly and so close to him. Now the three of us fired at the same time. Again the column disappeared for a short time, then split into several parts and hastily dispersed in a westerly direction…We opened with rapid fire on the fleeing enemy. Strange to say, we had not been fired on even though we were standing upright and were plainly visible to the enemy. To the left, on the far side of the clump of bushes where we were standing, Frenchmen came running down the highway. They were easily shot down as we fired at them through a break in the bushes at a range of about ten yards. We divided our fire and dozens of Frenchmen were put of action by the fire of our three rifles."

TRACER

Non-military folks make much ado about tracer ammunition…sometimes too much ado, if Hollywood action flicks are any indication.



A tracer consists of an FMJ projectile with a flammable tracer element in the base. The tracer element is intended to permit visible observation of the bullet's in-flight path, or trajectory, to the target. The tracer compound, in .30-caliber loads, burns out around 900 yards. Ignition of the tracer element doesn't take place until the bullet has left the barrel and the standard gliding metal FMJ jacket insures no damage to a barrel other than normal wear and tear. Interestingly, tracer bullets will even burn under water.

The .308 load is the M62, firing a 142-grain projectile at 2,750 fps, identified by an orange bullet tip. The .30-06 load, with the creative nomenclature of M1, has a velocity of 2,665 fps and has a red tip. If you just have projectiles, which are still fairly cheap, they are both .308 diameter and can be loaded in any rifle which uses those bullets…the .308, .30-06, .30/40 Krag, .300 Win Mags, etc. No matter what you see in asinine Hollywood shoot-‘em-up’s, tracer bullets do not make flammables blow up. NATO or US made tracer ammo is safe to shoot in any weapon of the appropriate caliber, i.e. being non-corrosive.

Accuracy fans are not much enamored of tracers. They start out at a different weight and velocity than the standard ball round and their mass and weight actually changes in flight as the tracer compound burns up. It’s “close enough for government work”, especially from machine guns and against moving targets.

Tracers do have their uses. They were primarily developed for anti-aircraft use, and can

of course still be used for that purpose. Nearly every treatise on anti-aircraft gunnery I've perused says that even the best anti-aircraft sights are just to get you close enough to walk your tracers onto target. All this is, of course, intended for machine gun use, but if rapid semi-automatic trigger work is the best that's available, well, that's it. Naturally, riflemen try to avoid the attentions of helicopters and such, but if one is determined to come after the squad there's nothing to be lost by trying to put some holes in it to make it go away.

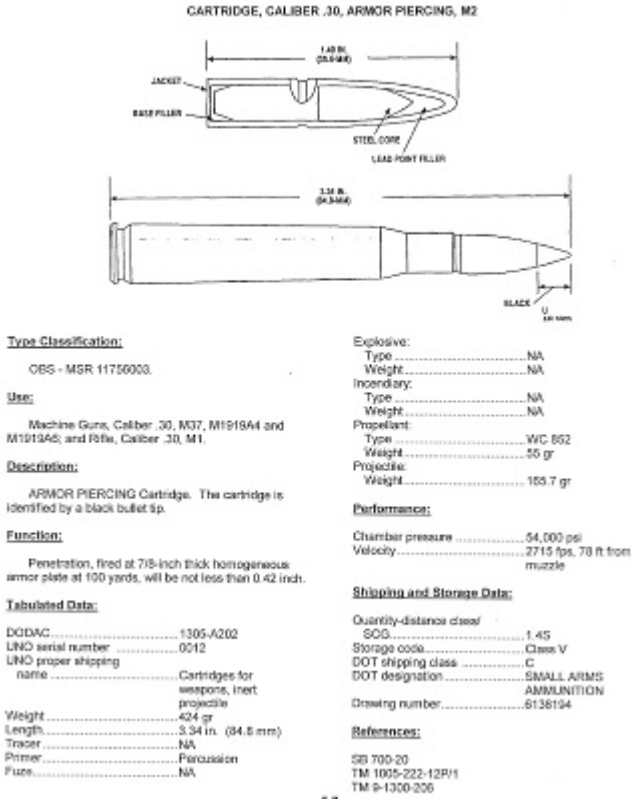
British infantry forces in the Falklands War were armed with the inch-pattern SLR FAL in semi-auto. When Argentine jets attacked the ships of the British fleet, they often overflew the infantry, who quickly found out their Blowpipe shoulder-fired Surface-to-Air missiles were somewhere between excretal and useless. So they engaged Argentine aircraft with SLR's (inch-pattern semi-automatic FALs) and GPMG's (Mag-58/M-240 machine guns).

"One British officer said that everything fired at attacking aircraft had good effect. If the aircraft was not shot down, the tracers and pyrotechnics intimidated the pilot into using his weapons prematurely, changing his interest, or aborting the mission. To ensure that the Argentine pilots knew they were being engaged by ground forces, the British relinked their machine gun ammunition to add more tracers. British ground forces were credited with downing three Argentine jet aircraft with small arms."

Tracers are also regularly used, especially by infantry leaders, to designate targets. "On my tracer!" We'll detail this particular use later, when team shooting is covered. Some folks also advocate the addition of three tracers at the bottom of your magazine so that you are alerted to the mag running dry.

One more interesting tracer of relatively recent design is the CARTRIDGE, 7.62MM, DIM TRACER, M276. This tracer can only be seen through night vision devices. The cartridge is identified by a pink ring behind a green tip.

ARMOR PIERCING



CARTRIDGE, CALIBER .30, ARMOR PIERCING, M2

JACKET
BASE FILLER
STEEL CORE
LEAD POINT FILLER
BLACK

Type Classification:

OBS - MSR 11750003.

Use:

Machine Guns, Caliber .30, M37, M1919A4 and M1919A5; and Rifle, Caliber .30, M1.

Description:

ARMOR PIERCING Cartridge. The cartridge is identified by a black bullet tip.

Function:

Penetration, fired at 7/8-inch thick homogeneous armor plate at 100 yards, will be not less than 0.42 inch.

Tabulated Data:

DODAC	1305-A202
UNO serial number	0012
UNO proper shipping name	Cartridges for weapons, inert projectile
Weight	424 gr
Length	3.34 in. (84.8 mm)
Tracer	NA
Primer	Percussion
Fuze	NA

Explosive:
Type ..... NA
Weight ..... NA
Incendiary:
Type ..... NA
Weight ..... NA
Propellant:
Type ..... WC 852
Weight ..... 55 gr
Projectile:
Weight ..... 165.7 gr

Performance:

Chamber pressure ..... 54,000 psi
Velocity ..... 2715 fps, 78 ft from muzzle

Shipping and Storage Data:

Quantity-distance class/ SCG 1.4S
Storage code ..... Class V
DOT shipping class C
DOT designation ..... SMALL ARMS AMMUNITION
Drawing number 6138194

References:

SB 700-20
TM 1005-222-12P/1
TM 9-1300-206

More useful for sheer hitting power and the most recognizable of the special purpose ammunition is the old WWII-vintage M2 “Black-tip” .30-06 armor piercing AP ammo. At present, CMP has some back in stock. Get it while the getting is good. This stuff used to be a dime a dozen at gun shows, but in recent years has become increasingly difficult to come by. Both the .30 M2 and the SS109/M855 62-grain “green tip” ammo were specifically exempted from the hysterical AP “cop-killer” BS law. It was supposed to apply to pistol cartridges that could penetrate police body armor, you know, like in *Lethal Weapon Part XVIII* or whatever it was, when Mel Gibson could shoot Teflon-coated 9mm rounds through the blade of a D-9 Cat. Since there are technically 7.62x39mm pistols, AP ammo in that caliber was banned. Taking it one big ludicrous step further in their “interpretation” of the law, the BATmen have decided that 7.62x51mm/.308 is also a *pistol* caliber.

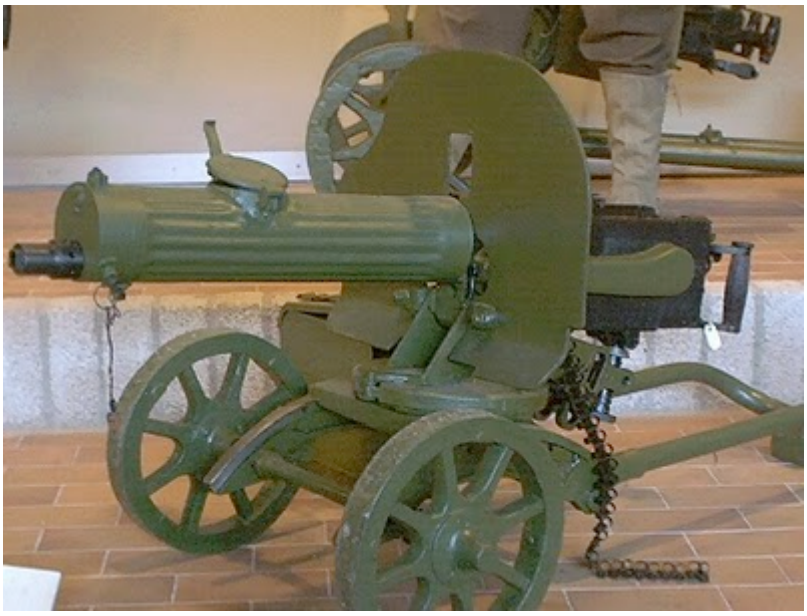
From THIS source:
2) AP ammo is the bullets ONLY, not the loaded ammo, although ATF has identified some AP ammo by the loaded ammo, not projectiles, for the information of FFL dealers, who are not supposed to "willfully" transfer AP ammo.
>From this it follows that loading the bullets identified above into completed rounds does not constitute "making" AP ammo; making the bullets themselves does.
4) Because of #1 and #2, it is OK to reload the AP bullets into any .30 caliber case. DON'T, however, SELL IT TO ANYONE - that is NOT legal.

So technically, the way a normal human would read the law, it is OK to "roll your own" .308 AP cartridges as long as you keep them for personal use and do not sell or distribute them. Of course, we've all noted how the Alphabet Soup agencies, the courts, and the politicians read laws a little differently than the rest of us. Especially that pesky Constitution thing, which I thought was in pretty plain English. Sometimes I think they drop acid and then read the laws under a strobe light to get the interpretations they do, but that's beside the point.

Anywayyyyy...the most common AP round, the .30-06 M2 ammunition, the so-called "black tip", launches a 165.7-grain projectile with a hardened steel alloy penetrator core at a muzzle velocity of just over 2,700 feet per second. The conventional gliding metal copper jacket of the full metal jacket ball rounds surrounds the penetrator, just like a regular ball round, to protect the rifle barrel. The Army manual describes this round's performance as: *"Penetration, fired at 7/8-inch thick homogeneous armor plate at 100 yards, will not be less than 0.42 inch."* At two hundred yards, the caliber .30 M2 AP is supposed to be able to penetrate a half inch of homogeneous armor plate and 0.3 inches of face hardened armor plate. At six hundred yards, the penetration is 0.3 and 0.2 inches respectively.

At 100 yards a single shot will penetrate 19 inches of sandbags, 48 inches of log timbers, 7 inches of concrete, and an inch of soft steel. I have a WWII U.S. Army training film showing a GI with a Garand easily punching holes clear through a four-inch thick concrete wall, flawlessly round after round, at 200 yards. I myself shot an old concrete farm silo that was due to be torn down. The walls were four inches thick. Upon entering the first wall, the AP bullet left a little .30-caliber hole with the copper jacket flattened around it. Where the projectile exited the interior wall, it has spalled out a shallow crater about the size of a dinner plate. The alloy penetrator core was embedded halfway through the far wall. When I chipped it out, the penetrator was still sharp on the tip.

The WWII *Combat Lessons* pointed out other uses for these AP rounds. In Italy, an infantry captain noted, *"We found that caliber .30 AP pierces enemy armored halftracks at close ranges."* Men of the 60th Division serving in France advised, *"In wooded country, have the men carry only armor-piercing ammunition; it will go through trees if the enemy uses trees as cover."*



Maxim 1910 with 24 pounds of steel gun shield but still "no cover for you!" Chicom gunners.

In Korea, another American infantryman recalled engaging Chinese machine guns at ranges of 300-350 yards. *"I shot into machine gun positions with those large Maxim machine guns with my M1. The armor piercing rounds would go right through the metal shield on the gun. We found guns with bullet holes through the shield and there would be AP slugs in the side of the receiver that stopped the gun from firing."* Yet another Korean vet gave the .30 AP a little test. *"One time I took two sandbags and laid them back to back and I emptied a Thompson magazine into them. It made a real good mess on the surface of the first sandbag. Then I took my Garand and fired one black-tipped bullet into the sandbags and it went through both bags. That's all you need to know. Range and penetration was the key factor."*

The modern version in 7.62x51mm is the M61 AP, a 150-grain projectile, again with a penetrator core and identified by a black tip. The manual somewhat vaguely says, *"The cartridge is used in rifles and machine guns against personnel and light armored or unarmored targets, concrete shelters, and similar bullet-resisting targets."* Technically, performance is approximately 10% less than the old caliber .30 M2.

The second generation of 7.62x51mm armor piercing is the Swedish Bofors-designed M993, a 126.6-grain tungsten penetrator-cored projectile launched at nearly 3,000 feet per second. It's intended purpose is to provide, *"...an enhanced armor penetrating capability for use in standard 7.62 mm weapons."* By the numbers, it can penetrate 1/4-inch of armor plate at 500 meters, and 1/2-inch at 100. Supposedly, they tested these on Russky BRDM-2 scout cars and penetrated the armor. Ouch! That's gonna leave a mark.

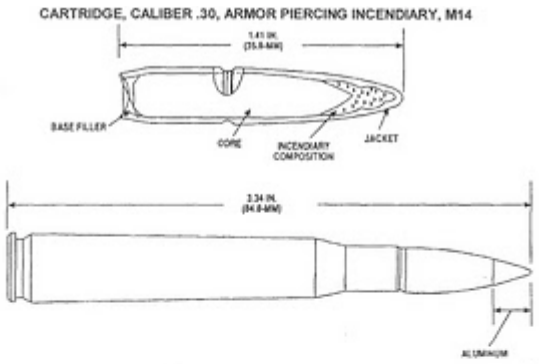
Not too shabby for the lowly 7.62mm. It's much harder to find, and I've seen it listed for $5 per round on up.

Various versions of the BRDM-2 armored scout car are still manufactured and used all over the world. Maximum armor is 14mm on the hull's front glacis plate , and the side armor is only 7mm. Many of the wheeled armored personnel carriers, such as the Russian BTR series, the Czech OT series, and the British Saracen have the same or less armor. Of course, for the maximum penetration listed, the M993 projectile must strike at a flat 90-degree angle. And it takes more than one hole.

Even harder to find is the M948 SLAP, Saboted Light Armor Penetrator. This load uses a plastic sabot to encase a sub-caliber 5.56mm tungsten penetrator launched at extremely high velocity. It is just about like the old Remington Accelerator hunting loads…"Turn your .30-06 into a varmint gun." The load can penetrate 15mm of armor plate at 300 yards. It also penetrates 120mm of helicopter Plexiglas and is highly effective on brick and concrete walls. It is identified by a black stripe on the bullet nose. Of course, these cartridges are extremely hard to come by. Figure on a bare-ass minimum of $10-$20 a pop, usually more, for this ammo…if you can find it.

This load could be fairly well duplicated through reloading a .223/5.56mm M855 62-grain "green tip" projectile into a .30-caliber plastic SABOT. Using .223 soft point hunting bullets, I was never able to get any real decent accuracy out of a SABOTed .30-06 or .308… i.e. dinner plate-sized groups at 100 yards. Not good enough to hit a coyote or fox, IMHO. But get 'er up there around 4,000 fps and it will by God penetrate.

ARMOR PIERCING INCENDIARY



U
AR 5907

Type Classification:
OBS - MSR 11756003.

Use:

Machine Guns, Caliber .30, M37, M1919A4 and M1919A6; and Rifle, Caliber .30, M1.

Description:

ARMOR PIERCING INCENDIARY Cartridge. The cartridge is identified by an aluminum bullet tip.

FUNCTION:

Penetration, fired at a 7/8-inch steel plate at 100 yards, will not be less than 0.42 inch. Upon impact with a target, the incendiary composition bursts into flame and will ignite flammable material.

Tabulated Data:

DODAC	1305-A202
UNO serial number	0012
UNO proper shipping name	Cartridges for weapons, inert projectile
Weight	407 gr
Length	3.34 in. (84.8 mm
Tracer	NA
Primer	Percussion
Fuze	NA
Explosive:	
Type	NA
Weight	NA
Incendiary:	
Type	IM 11
Weight	2 gr
Propellant:	
Type	WC 852
Weight	50 gr

Performance

Chamber pressure	54,00() psi
Velocity	2780 fps, 78 ft fro muzzle

Going one step further and one step better is the armor piercing incendiary or API. These not only have nearly the same increased penetration as the regular AP, but they also carry an incendiary compound. The manual for the M14 caliber .30 API states: *"Penetration, fired at a 7/8-inch steel plate at 100 yards, will not be less than 0.42 inch. Upon impact with a target, the incendiary composition bursts into flame and will ignite flammable material."*

Even .30-caliber API will not necessarily to set off gasoline tanks and cause giant orange mushroom clouds 300 feet in the air, like in the movies. Then again, as convoy ambushes in Iraq have shown, sometimes not even a direct hit from an RPG-7 rocket-propelled grenade sets off a fuel tanker. Of course, your chances of touching something off *without* API are near nil, so it sure beats a poke in the eye with a sharp stick.

One-inch thick soft steel plate at 100 yards with an M1 Garand. The rusty hole is from the standard .30-06 M2 black-tip AP. The rest are from the 155-grain re-sized Russian API loaded in .30-06. Note the black scorch marks on the metal.

The .30-06 API penetrated this 3/4-inch hard steel plate at 100 yards. As you can see, standard 150-grain full metal jacket ball ammo merely cratered one side.

This stuff used to be almost impossible to come by, and expensive, but if you act now you can get 155-grain API bullets for a fairly reasonable price at GunBroker. These were pulled from Russian 7.62x54R ammo (.311 diameter) and professionally re-sized to .308 diameter. The loaded ammo will cost you an arm and a leg.

I bought a pack of 50 projectiles, loaded them in .30-06, and was very pleased with the results from my M1 Garand. Upon impact with a hard target, an inch-thick 10-inch soft steel plate in my case, the compound goes off with a visible flash, a puff of smoke, and a quite audible report. Penetration is so close to that of the M2 AP as to be hardly noticeable.

MISC.

During Vietnam, there was a duplex load for the 7.62x51mm which fired two 84-grain projectiles loaded one atop the other, for suppressive fire. It was about as accurate as you would expect. Frangible rounds exist for use when over penetration is an issue, as in for use by police snipers or room-clearing. Various Match-Grade loads are available, but these are pretty much wasted on battle rifles and should be used in sniper rifles. There are blanks and grenade launcher blanks; you can't use the former for the latter purpose. Of course, it's kind of irrelevant without rifle grenades anyway.

So there you have it. Similar special purpose ammunition exists for all the old battle rifle cartridges; .303 British, 7.62x54R Russian, German 8mm Mauser, etc. but it is harder and harder to come by. Get it while you can, boys and girls.