Karl from Ohio Ordnance Works with a PTRS.

THE PTRD & PTRS ANTI-TANK RIFLES

by Chuck Madurski

The uneasy peace that characterized the years immediately prior to World War Two was also a time of urgent activity for many of the world's military powers. In certain areas such as aircraft and tanks, the technology of war had advanced seemingly exponentially. Aircraft were shedding their extra wings and getting faster and more deadly. Armored vehicle designs were experiencing similar advances and war planners were busy developing new tactics to take advantage of these new capabilities.

By the late 1930's, most militaries with anti-tank rifles in their inventory had discarded them as obsolete and ineffective. After all, most new tank designs included armor far too thick to be penetrated by a shoulder fired arm, they reasoned, so the weapon of choice for defense against tanks was to be field artillery. Notable exceptions were the 20mm class of cannons such as the Solothurn and the Lahti, and the 14.5mm Soviet rifles that are the subject of this article.

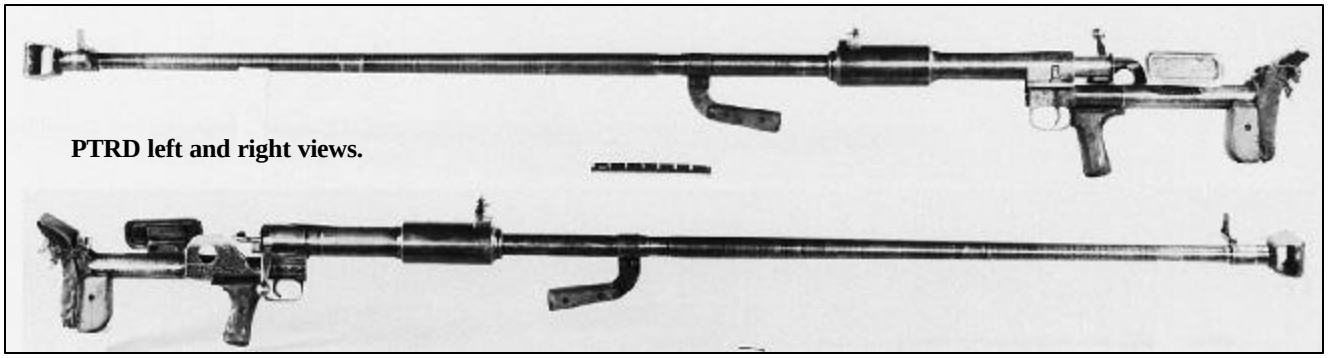
In November 1938, the Soviet Union was barely 20 years old. They were still having difficulties meeting the armament needs of a peacetime army that had far more manpower than arms. And there were strong indications war was coming. Recognizing these contradictory facts, the Artillery Committee of the RKKA Artillery Directorate issued a report that foresaw the probability their under-equipped army would eventually be forced to fight against tanks with only infantry. Further, they decided that the anti-tank rifle was the solution, and that it would be useful as an anti-material weapon as well.

Earlier that year, a suitable 14.5mm cartridge had been designed, featuring a 64 gram (986 grain) boat-tailed armor piercing incendiary bullet with hardened steel core. Muzzle velocity was 1000 meters per second (3280 fps). The design was finalized in 1940 and adopted as the "14.5mm cartridge with B-32 bullet".

A much improved bullet was adopted in August of 1941, the BS-41. This was a flat-based bullet of API construction but the penetrating core was now made of tungsten carbide. While the B-32 was designed to penetrate 20mm of light armor at ranges up to 500 meters at impact angles as great as 60 degrees (or 30 degrees off of perpendicular), the BS-41 could defeat armor as thick as 35-40mm at ranges less than 300 meters. Thus, until the later models of the German Pzkw IV were fielded, the Soviet 14.5mm anti-tank rifles were capable of defeating all known enemy armor within certain parameters.

The Rukavishnikov anti-tank rifle of 1939 was selected to fire the new 14.5mm cartridge though it was never made in quantity. This was due to several factors. First, the Soviets overestimated the thickness and quality of German armor. Second was their reluctance to divert resources away from the urgent production of other needed war materials such as the PPD submachine gun. Lastly it had been demonstrated that the Rukavishnikov design was too complicated to manufacture under wartime conditions given the state of the Soviet Union's industrial base.

It did not take long for this decision to backfire for in July 1941 Stalin took a personal interest in the situation regarding Soviet infantry versus German tanks. When it was clear that the Rukavishnikov rifle was not fully developed and could not be placed into mass production soon enough, it was ordered that two of the Soviet Union's most respected arms designers were to produce new designs as fast as possible. Using two different paths to



PTRD left and right views.

completion, Vasiliy Degtyarev and Sergey Simonov reportedly fired the first shots from their respective designs in less than a month.

The PTRD-41

The PTRD 1941 (14.5mm protivotankovoe ruzhe sistemy Degtyareva, obr. 1941 g.) is a single shot rifle that looks minimalist in the extreme. Except for the pistol grip and the cheek and butt pads, it is made entirely of steel. The shooter's face and the sights are offset to the left. The reason for this is to keep the face clear of the recoiling parts, especially the bolt. For while the PTRD is single-shot, it operates somewhat on the long recoil system. Upon firing, the barrel and breech bolt recoil to the rear, during which the bolt handle rides up the inclined plane of a plate welded to the right side of the stock tube, unlocking the bolt. At that point, the bolt is retained in the rearward position and the barrel moves forward back into battery, extracting and ejecting the fired case leaving the rifle ready for the next round to be loaded and the bolt closed manually. This serves to both increase the rate of fire and ease the problem of difficult extraction common in rifles of this power. A skilled team of gunner and loader can achieve 8-10 rounds per minute with this action.

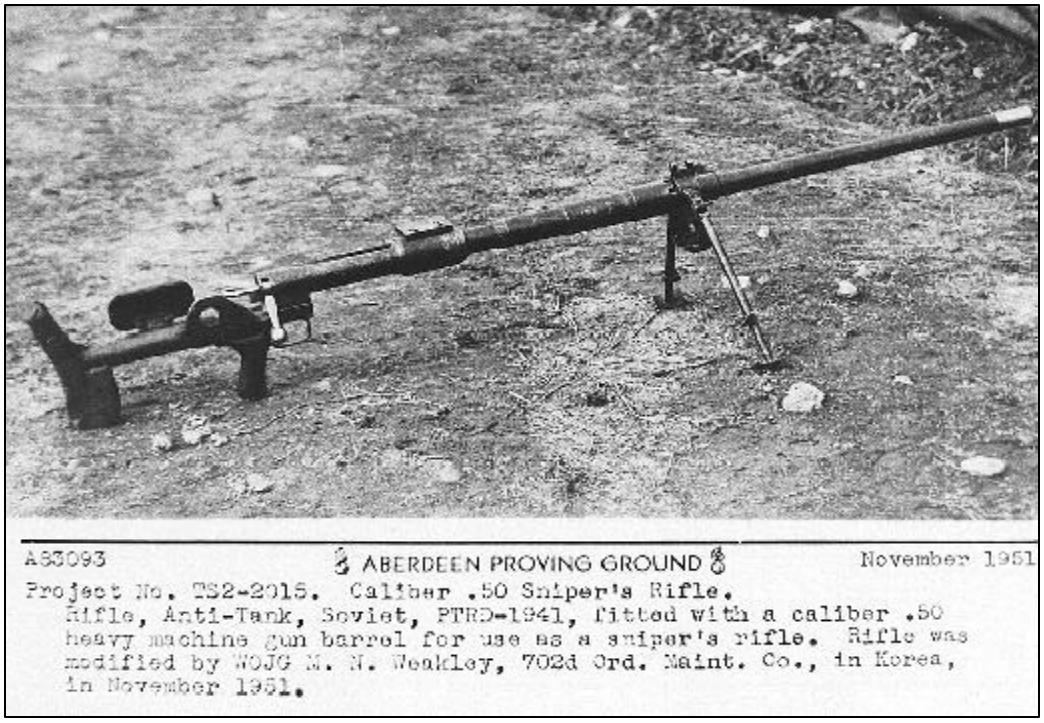
The PTRD weighs 17.3 kg (38lb 2oz) and is equipped with a carrying handle and a bipod. The breech is locked by a conventional twin-lugged bolt turned through 90 degrees. The barrel is 1227mm (48.3 in) in length and has eight grooves with right hand twist. The overall length is 2000mm (78.7 in). The tubular buttstock is spring loaded to assist the muzzle brake in absorbing the fierce recoil upon firing. The safety is applied by pulling the hook shaped protrusion from the rear of the bolt and turning it 90 degrees, similar in practice to the safety on the Moisin-Nagant rifle.

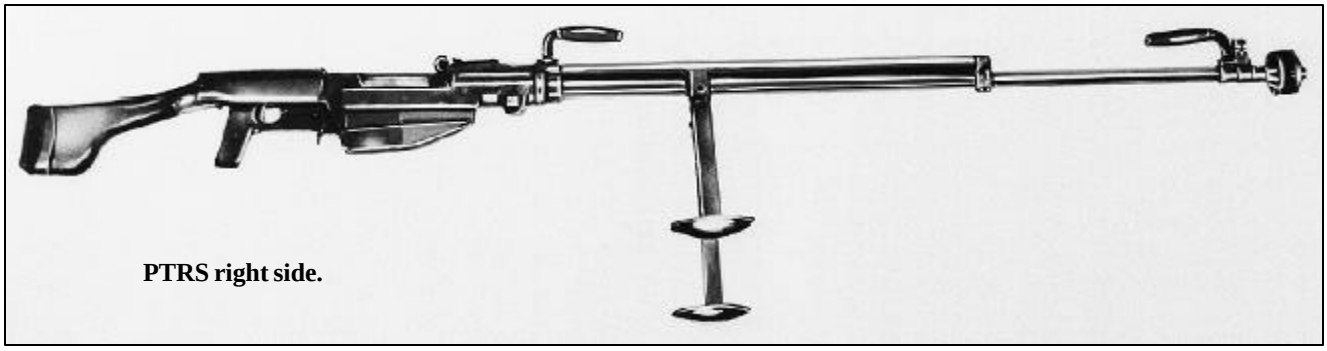
One of the greatest advantages to the PTRD's success was the simple manufacturing technology required to mass-produce it. Almost the entire gun could be turned out on lathes, with over 17,000 being produced before the end of 1941 alone.

The PTRS-41

Simonov used his auto-loading rifle design of 1938 as the basis for the PTRS 1941 (14.5mm protivotankovoe ruzhe sistemy Simonova, obr. 1941 g.), though the family resemblance is even stronger with the later SKS-45 including the fixed box magazine. A departure of interest is that the PTRS is loaded by inserting a five round clip of ammo much like an oversized M1 Garand.

Locking of the breech is by a tilting bolt that is similar to the previously mentioned SKS or the FN FAL. The semi-automatic mechanism is conventional with a gas piston operating on a bolt carrier. The safety is on the right side of the receiver. Like the PTRD, the PTRS is equipped with a bipod and carrying handle. It can also be taken down to allow transport by two men. The barrel is 1220mm (48.0 in.) long and overall length is 2134mm (86.61 in.). It is also heavier than the PTRD at 20.86kg (46lb 3oz). Its performance is the same as that of the PTRD, though the Soviets were hoping for an advantage over the single shot due to its self-loading capability. Instead, the PTRS was not quite as robust as





PTRS right side.

the simpler gun, and the increased weight and length also hampered it in combat.

In Use

Tanks in WWII were not as tightly packaged as today, and while the 14.5mm cartridge was generally capable of piercing the armor of many of the tanks it faced, often the bullet just sailed right on through, missing anything that would disable the tank, like main gun ammunition or one of the crew members. It was not unusual to find a German tank after a battle with as many as a dozen or more holes in the armor as Soviet infantry anti-tank rifle teams did their jobs. By mid-1943, though, both rifles were already proving less effective against the latest German tanks and were soon relegated to anti-material duty. Sometimes brave souls would try to use one in an anti-aircraft role.

Other Notes

Production of both rifles ended in 1945. They were often deployed in platoon and even company strength. The PTRS was sometimes encountered mounted on lend-lease Universal (Bren) Carriers. A common complaint with both rifles was that the muzzle brake caused excessive blast to be directed against the shooter.

The Germans thought highly enough of both designs that when captured with ammunition in sufficient quantities, they re-issued the guns to their own troops. The PTRD was known as the 14.5mm PaB 783 (r), and the PTRS was the 14.5mm PaB 784 (r).

After the War

Some sources indicate the PTRS was used in small quantities in Korea. The PTRD were fitted with telescopic sights and used as long range sniper rifles during the Korean War. Effective range when used in this role was about 1500 meters, and there was still substantial power in the projectile at that range. The PTRD was also reported to be in frontline service in Albania as recently as the 1980's.

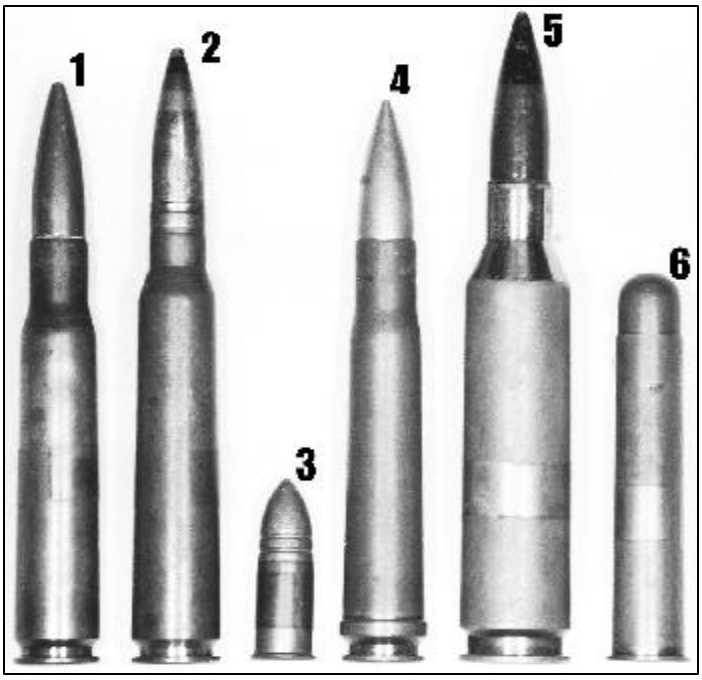
The 14.5mm cartridge itself gained a new lease on life in 1949 with the Soviet adoption of the Vladimirov KPV heavy machine gun, usually seen on Tanks, APVs and in twin and quad mounts.

Today

At the April 2002 Knob Creek shoot, there was only one 14.5mm rifle for sale; the PTRS pictured from Ohio Ordnance, though it was expected that the PTRD would have been more prevalent. Clips for loading the PTRS were unavailable. In original configuration, either rifle is classed as a Destructive Device due to the over 1/2 inch bore size. Over the years, many of these, especially the PTRD, were converted to .50 BMG. Reloaded 14.5mm "practice" ammo with a turned brass bullet is available from Big Sky Surplus. They also have dies for resizing as well as other components and information for these monsters.

Designed during a dark moment for the Soviet Union during WWII and likely the largest "small arms" round ever to be fielded, the 14.5mm cartridge along with the PTRD and PTRS anti-tank rifles, performed as planned and gave the under-equipped Soviet infantryman a fighting chance against German armor. Though the rifles were mostly obsolete by the end of the war, the cartridge itself soldiers on to this day.

Dan's note: *The KP/KT 14.5mm ammunition in use today in many countries is <u>significantly</u> "Hotter" than these old warhorses were designed for. We <u>strongly</u> suggest that latter date 14.5mm ammunition shooters pay very close attention to signs of possible headspace opening up-look for evidence of strain on the fired cases. If you start experiencing case separations, it is time to take a closer look.* ***Safety first, of course.***



<u>Below:</u> 1 •.50 BMG, 2 • 12.7x108mm Russian, 3 • .56-50 Spencer Rimfire, 4 • .55 Boys, 5 • 14.5x114mm Russian, 6 • .600 Nitro Express.