RPK: Kalashnikov's Squad Automatic

Kokalis says if you avoid the 40-round magazine and don't shoot it too fast, this Soviet-era SAW can do the job.

Text and photos by Peter G. Kokalis

The RPK has the usual Kalashnikov reliability and is accurate enough for the squad automatic role. It was well suited for fighting in closed-in, urban environments.

Adopted by the Soviet Army at the end of World War II, the RPD (Ruchnoi Pulemet Degtyareva) squad automatic weapon (SAW) served with the Russian armed forces until 1961 when it was replaced by Mikhail T. Kalashnikov's RPK (Ruchnoi Pulemet Kalashnikova). Both of these weapons were chambered for the then standard intermediate-size 7.62x39mm cartridge. The chambering of the RPK was changed to the 5.45x39mm round with the introduction of the AK74 rifle in that caliber and its general standardization throughout the Soviet Army.

The RPD is belt-fed and weighs 15.6 pounds (7.1 kg), empty. The RPK is magazine- or drum-fed and weighs only 11 pounds (5.0 kg), empty. Overall length of the RPK is 40.94 inches (1040mm). The barrel is 23.25 inches (590mm). This is about 7 inches longer, and somewhat heavier, than the AK47 barrel. It has four rifling grooves with a 1:9.45 right-hand twist when chambered for the 7.62x39mm cartridge. The bore and chamber are chrome-lined—a tradition with Soviet small arms dating back to World War II.

The metal components, except for the chromed piston shaft, are finished with black baked enamel over phosphate. There is no flash hider, but the muzzle is threaded, apparently to accept a BFA (Blank Firing Attachment), and a thread protector is held in place by a spring-loaded detent rod.

Neither the RPK or RPD were provided with a quick-change barrel system. This is a serious design deficiency and limits their deployment to short bursts and very definitely limits sustained fire. Firing more than 80 rounds without interruption will often lead to "cook-offs." I have personally witnessed the front handguards of an RPD burst into flames as a direct consequence of overheating.

Heat and its effect upon the operation of machine guns cannot be easily dismissed as an important design parameter. While some heat comes from the friction between the projectile and the bore, most results from the propellant gases. The total amount of heat produced is a function of the propellant's charge weight, its burning rate and the flame temperature. Propellant flame temperatures average close to 2,000° Celsius.

The amount of this heat that gets transferred to the barrel depends upon the chemistry of the gases, the barrel material, the bore's cross sectional area and the temperature difference between the barrel and the gases. Heat input is greatest

The RPK's 11 pound weight is appealing to any ground pounder. Its cyclic rate of 650-700 rounds per minute is a bit lower than usually encountered on AK-type rifles.

RPK, field stripped. Disassembly of the RPK is quite easy and follows the usual AK sequence. Never put lubricant of any kind in the gas cylinder or on the piston.

at the chamber end of the barrel and decreases toward the muzzle.

Three processes are involved in heat movement from the bore to the barrel's surface and thence to the atmosphere. Heat moves from the bore to the barrel's outer surface principally by conduction. Theoretically, a thin barrel would speed conduction of heat to the barrel's outer surface. However, heat loss to the atmosphere remains so slow that overheating would still occur; to minimize this, designers thicken the walls to create, in essence, a heat reservoir or "sink."

Movement of heat away from the barrel by means of natural convection is of small consequence, except in aircraft machine guns. As the temperature of the barrel rises, thermal radiation becomes the primary form of heat loss.

Wear is a form of actual mechanical abrasion caused by the projectile moving down the barrel. Layers of metal are gradually removed from the bore. Erosion is the etching away of the bore's surface by hot propellant gases. High barrel temperatures accelerate both effects and can literally destroy a machine gun barrel in a matter of minutes. To prevent this, bore temperatures must remain below 550° Celsius. This is not always possible in combat.

High barrel temperatures also temporarily expand the bore diameter by as much as 0.028mm per 100° Celsius rise in temperature and weaken barrel strength enough to induce permanent deformation.

Premature ignition of the cartridge, referred to as a "cook-off," looms as a real possibility when barrel temperatures greater than 250° C are maintained for more than a minute, since ignition temperatures for small arms propellants range between 180° and 200° C. The cartridge case itself offers some protection because it takes time for the chamber heat to pass through the case wall to reach the powder. So, as long as the round remains in the chamber only momentarily, cook-off is not a problem.

For this reason, most machine guns used in the sustained-fire role fire from the open bolt. Unfortunately, the RPK, like the AK47/AKM rifles series, fires from the closed-bolt position. A quick-change barrel system should have been a mandatory element in the weapon's design. Aside from this serious criticism, the RPK generally provided adequate service in its deployment as a lightweight squad automatic weapon system.

To help alleviate the problem of overheating, the RPK's pinned and riveted receiver body is formed from 1.5mm-thick sheet metal instead of the 1.0mm-thick material used to fabricate the AKM. Yugoslavian AKM rifles are also made from 1.5mm-thick sheet metal and, in my experience, this has the added benefit of slighting increasing the accuracy potential, as the additional structural rigidity resulting from this reduces the receiver's rotational torque during the operating cycle.

Heat and its effect upon the operation of machine guns cannot be easily dismissed as an important design parameter.

There are also two prominent reinforcing ribs, one on each side of the receiver wall and directly below the trunnion—almost 3 inches in length—each attached by a single rivet. They further serve to strengthen the receiver and stabilize it during the recoil and counter-recoil travel of the reciprocating parts. Some parts, such as the bolt, are many times interchangeable between the RPK and AKM.

The RPK has been manufactured since its adoption at Vyatskiye Polyany, in the Kirov region near Russia's border with Tatarstan. Six thousand of the city's 60,000 inhabitants work at the Vyatskiye Polyany Machine Building Plant (known as Molot J.S.C.—the word "molot" stands for "hammer," as in the old Soviet hammer and sickle logo). Molot is a justifiably famous facility of Russian small arms. During World War II this factory manufactured 2.5 million PPSh41 submachine guns, out of approximately 5.5 million made throughout the Soviet Union during the war. At that time they also produced about 350,000 flare signal pistols. Weapons made at this factory were roll-marked with a communist five-pointed star in a shield.

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The RPK is equipped with a sturdy bipod fabricated from U-shaped sheet metal by punch welding and riveting. The command height is about 11.5 inches and is not adjustable.

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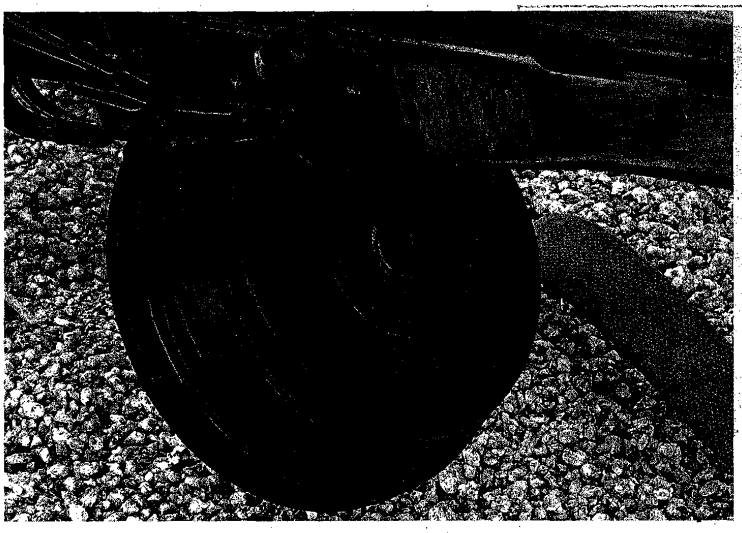


The magazine loading lever must tediously be released and depressed again before each round can be loaded. This drum has an extension inserted into the magazine well.

The buttstock was designed so the operator's support hand can be wrapped around th bottom front to provide a stabilizing effect when firing from the prone positio

command height (the distance from the bore's axis to the ground with the bipod deployed) is about 11.5 inches and is not adjustable. It is spring-loaded, and when the legs are pressed together and folded rearward, the bipod rests under the barrel, with the legs held together by a hinged U-shaped clamp.

When deployed, the bipod can be rotated approximately 15° to the right or left around the bore's axis. Whenever possible, the RPK should be fired from the prone position off its bipod.

The large and distinctive buttstock has been taken from the RPD. It was designed so that the operator's support hand can be wrapped around the front of the buttstock at the bottom to provide a stabilizing effect when firing from the prone position.

The caliber 5.45x39mm RPKS variant features a side-folding buttstock. The buttstock, pistol grip and both upper and lower handguards are made of laminated wood. There is a storage hole for the cleaning kit in the buttstock covered by a hinged, spring-loaded sheet metal circular plate that is part of the uncheckered, sheet metal buttplate. The rear sling swivel is attached to the bottom left side of the buttstock. The front sling attachment point is on the left side of the bracket that holds the front ends of the upper and lower handguards. The sling itself, made of the usual mustard-colored webbing, is considerably longer than the AK's.

The front sight assembly sleeves over the barrel and is held in place by a single crosspin. The AK-style round post front sight has protective ears. It can be adjusted for elevation zero by screwing it up (to lower the point of impact) or down (to raise the point of impact) in its base. It can be drifted to the right or left for adjustment of windage zero by tapping its cylindrical base pin with a hammer, or, better yet, with a special armorer's tool designed just for that purpose.

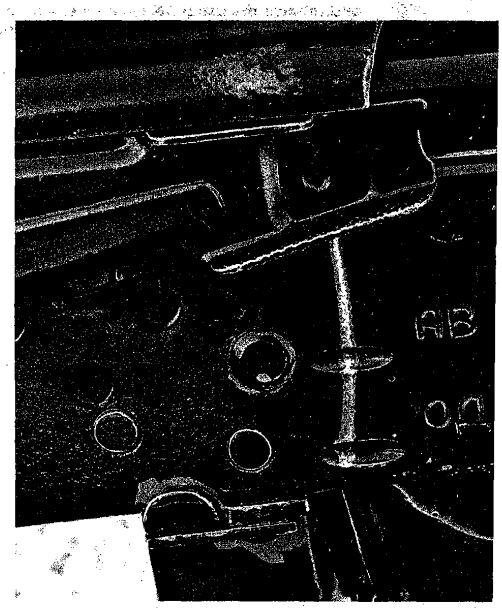
The sliding tangent-type elevation scale on the RPK's rear sight covers elevations from 100 to 1000 meters in 100-meter increments. The open U-notch can be adjusted for windage zero. The spring-loaded windage adjustment knob is on the right side and must be pulled out to operate. Rotate the adjustment knob clockwise to move the sight and the point of impact to the right, and counterclockwise to shift the point of impact to the left. There is an additional flip-up open U-notch that has a white horizontal line with a self-luminous dot in the center for firing in low light level environments. It also serves as the 300-meter battle sight setting.

Bottom-fed, the RPK will accept 30-round AK47/AKM magazines, a 40-round magazine designed specifically for it or a 75-round drum magazine. The worst choice is the 40-round box magazine. With the operator in the prone position, the weapon will invariably "monopod" on the base of the magazine, lifting off the bipod with a complete loss of stability.

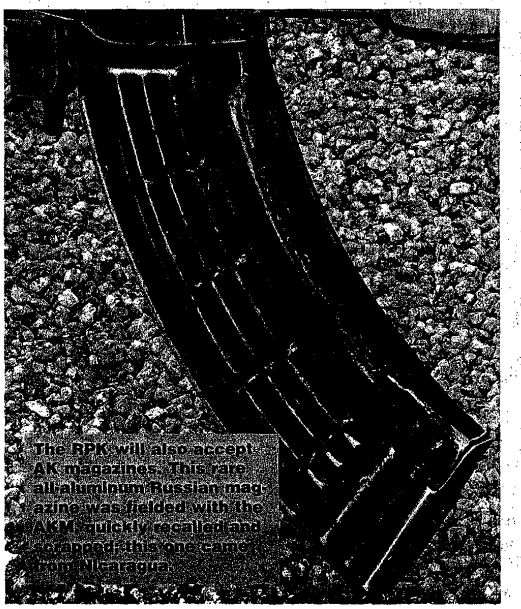
When I was in Afghanistan in 1983, I examined dozens of RPK-74 40-round magazines and all had badly scuffed floorplates, a certain indication that these magazines were too long for prone firing. The 30-round magazine will not cause the RPK to lift off its bipod legs, but its capacity is too limited for a SAW.

The Russian 75-round drum magazine is far more substantial and reliable than any of the Chinese AK drums I have examined. It has a loading lever on the front that is used to depress the magazine spring before each round is inserted. It must be released and depressed again before another round can be loaded and this is an especially tedious process. This drum has an extension on top that is inserted into the receiver's magazine well. When installed the drum slopes forward at about a 45° angle.

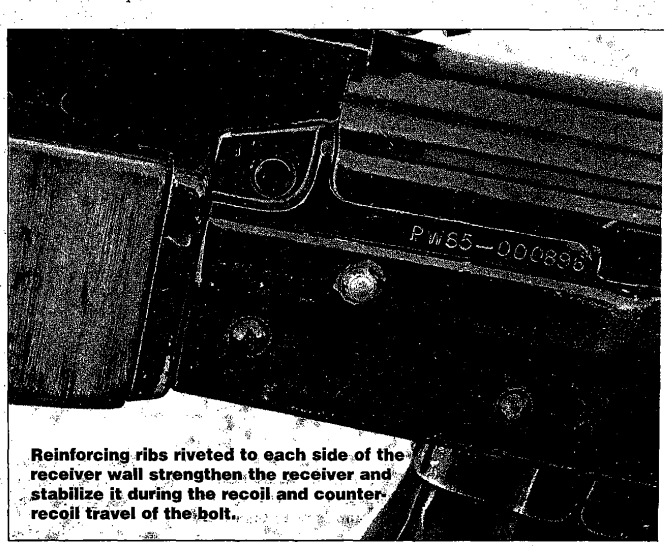
The RPK has been generally well received by the troops to whom it was issued. It possesses the usual Kalashnikov reliability and is accurate enough for the squad automatic role. Its 11-pound weight is an appealing feature to any ground pounder. The only major criticism against it is the lack of a quick-change barrel system and the resultant deficiency for deployment in the sustained-fire role. It has a cyclic rate of between 650 to 700 rounds per minute. This is just slightly lower than that usually encountered on AK-type rifles.



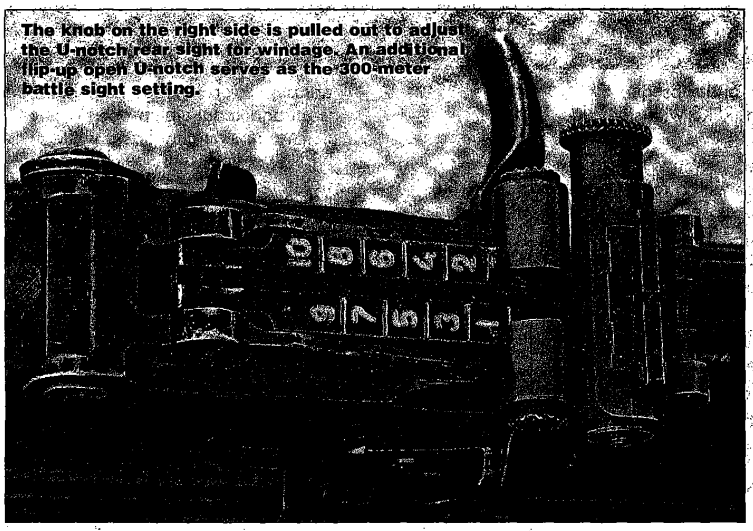
The top safety lever position is safe. The midd position, marked "AB" (Cyrillic), is for full-auto. The lo est position, ("OD"), provides semi-auto fir



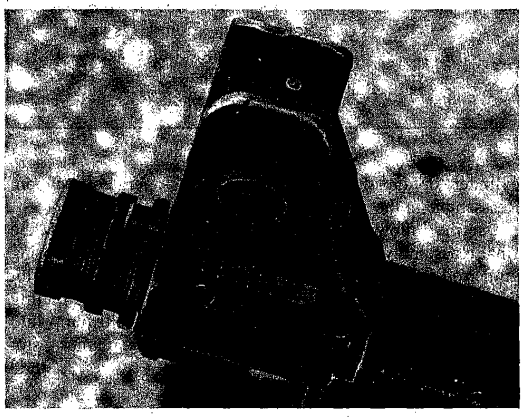
The RPK will also accept AK magazines. This rare all-aluminum Russian magazine was fielded with the AKM, quickly recalled and scrapped; this one came from Nicaragua.



Reinforcing ribs riveted to each side of the receiver wall strengthen the receiver and stabilize it during the recoil and counter-recoil travel of the bolt.



The knob on the right side is pulled out to adjust the U-notch rear sight for windage. An additional flip-up open U-notch serves as the 300-meter battle sight setting.



The post front sight can be adjusted for elevation and windage. The muzzle nut protects threads apparently designed for installation of a blank firing attachment (BFA).

RPK—METHOD OF OPERATION

All Kalashnikov rifles and squad automatics are gas-operated, without an adjustable gas regulator, and fire from the closed-bolt position. The RPK's gas port is located 8.5 inches (216mm) from the beginning of the rifling and 11 inches (279.4mm) from the muzzle. After ignition of the primer and propellant, gases are diverted into the gas cylinder on top of the barrel.

The hard-chrome-plated piston is driven rearward and the bolt carrier, attached to the piston extension, goes through about 8.5mm (.335") of free travel until the gas pressure drops to a safe level. The piston and bolt carrier are threaded and pinned together with a slight amount of free play that is designed to absorb the initial impact of the recoil impulse.

A cam-slot milled into the bolt carrier engages the bolt's cam lug and rotates the bolt about 35° to the left to unlock it from its recesses in the barrel extension. Unlike many other designs, the Kalashnikov system provides no primary extraction during the bolt rotation. Thus, an exceptionally large extractor claw is required in all calibers. The fixed ejector is part of the left side receiver guide rail. The cocking handle is permanently attached to the bolt carrier and reciprocates with it.

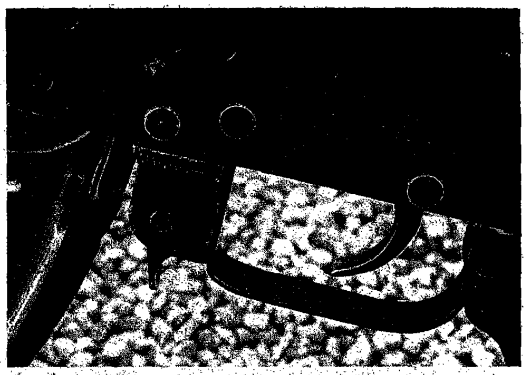
As the bolt travels back, it rolls the hammer over and compresses the recoil spring. The bolt group ceases its rearward travel when the carrier slams into the rear end of the receiver. The recoil spring then drives the bolt group forward, another round is stripped from the magazine and chambered, and the bolt then comes to rest. The bolt carrier continues onward for about 5.5mm (.22") after the bolt's two locking lugs have engaged their recesses in the barrel extension.

The RPK's long, single-coil recoil spring is wrapped around a two-piece, telescoping guide rod assembly. The front retaining cap permits separation of the spring and rod assembly. The rear end of the guide rod assembly slides into a notch on top of the receiver's end piece and serves to hold the stamped sheet-metal receiver top cover in place.

The trigger mechanism is based on the US .30 M1 Garand's. The hammer has two hooks, and there are two sears: a primary sear on an extension of the trigger and a spring-loaded secondary sear directly to the rear. When the hammer is cocked its left side hook is held by the primary sear. When the trigger is pulled, the trigger extension rotates forward and the primary sear disengages, leaving the hammer free to rotate forward.

In semiautomatic fire, when the bolt rolls the hammer back, it is caught at the rear by the secondary sear. When the trigger is released, the trigger extension and primary sear move back to catch the hammer as it is released by the secondary sear. In full-auto, a boss on the selector-lever axis pin forces the secondary sear back so that it plays no role in controlling the hammer. The trigger mechanism's multiple-strand mainspring lasts longer and offers better performance under adverse conditions.

The auto-safety-sear protrudes through a slot in the right receiver rail of all Russian-made, selective-fire AK-type rifles and squad machine guns. In full-auto, the auto-safety-sear holds the hammer back and it must be tripped by the bolt carrier to free the hammer to fire another round. There is a five-component anti-bounce device that was added to the trigger mechanism when pinned and riveted, sheet metal receivers replaced the milled, forged receivers of the AK47 series. Its primary function is to prevent firing out of battery during burst fire sequences.



Like other Kalashnikov designs, the RPK has a flapper-type magazine catch placed in front of the trigger. Magazines and drums must be rocked into the magazine well.

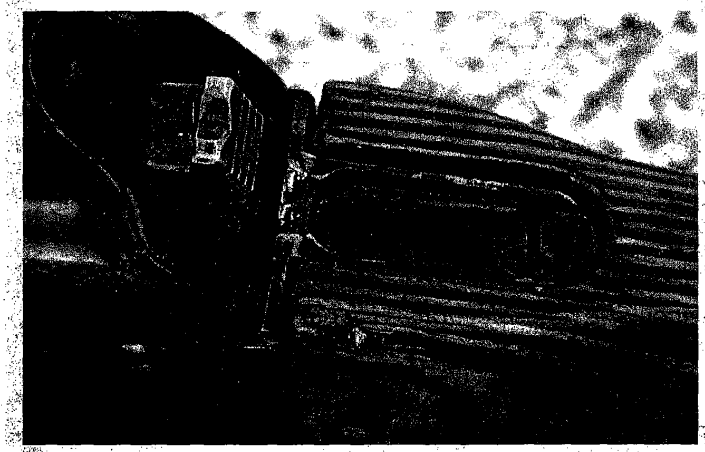
The selector lever, a stamped sheet-metal bar on the right side of the receiver is manipulated by the thumb and remains, in my opinion, one of the Kalashnikov's few serious defects. It is noisy, stiff and difficult to operate. The top position is safe and is unmarked. In this position, the trigger is blocked, but the bolt can be retracted just enough to see if the chamber has a loaded round.

All Kalashnikov rifles and squad automatics are gas-operated, without an adjustable gas regulator, and fire from the closed-bolt position.

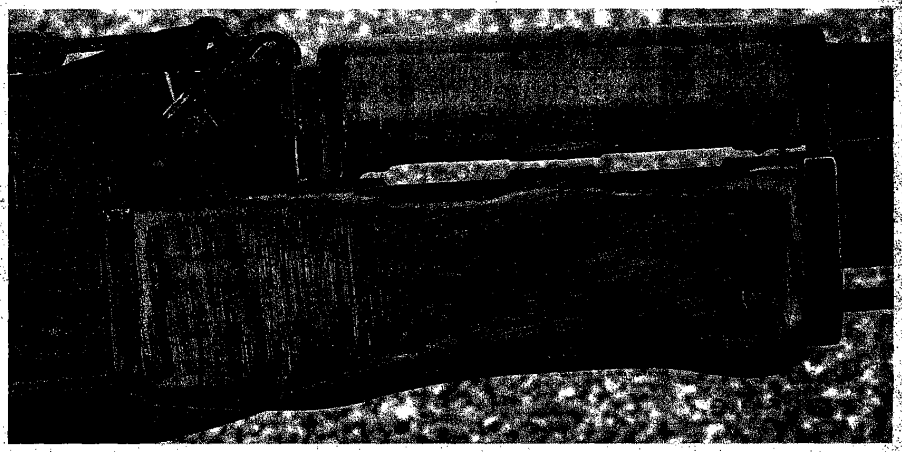
The middle position, marked "AB" (Cyrillic), is for full-auto fire. The lowest position, also marked with Cyrillic characters ("OD"), will provide semiautomatic fire. The selector lever sequence is well thought out. Under stress, operators will invariably push the lever all the way down from safe to semiautomatic. To fire in the full-auto mode, they have to consciously lift the lever back up to the middle position. By this means they are more inclined, at least at the beginning of a sudden contact, to fire in the preferred semiautomatic mode that will always result in greater hit probability.

DISASSEMBLY PROCEDURES

Disassembly of the RPK is quite easy and follows the usual AK sequence. Remove the magazine and clear the gun after plac-



Place the recoil spring guide rod in front of and below its slot. Hold down the top cover while retracting the cocking handle. The guide rod will jump into place.



Because the RPK does not have a quick-change barrel, firing more than 80 rounds without a break will induce a "cook-off." Kokalis has seen handguards burst into flame.

The RPK's pistol grip is made of laminated wood in the same configuration as the AK47's grip. It exhibits excellent human engineering, if not refined aesthetics.

RPK SPECIFICATIONS

Caliber:	7.62x39mm and subsequently 5.45x39mm (RPKS with side-folding buttstock).
Operation:	Gas-operated without a regulator, locked-breech with a rotary bolt, fires from the closed-bolt position.
Feed:	30- and 40-round two-position-feed, staggered-column, detachable box-type magazines and 75-round drum magazine.
Weight, empty:	11 pounds (5.0kg).
Length, overall:	40.94 inches (1040mm).
Barrel:	Chrome-lined bore and chamber. Four rifling grooves with a 1:9.45 RH twist, when chambered for the 7.62x39mm cartridge.
Barrel length:	23.25 inches (590mm).
Sights:	Round post front sight with protective ears, adjustable for elevation and windage zero. Open U-notch, sliding tangent rear sight with elevations from 100 to 1000 meters in 100-meter increments, adjustable for windage zero. There is an additional flip-up open U-notch rear sight that has a white horizontal line with a self-luminous dot in the center for firing in low light level environments. The dot serves as the 300-meter battle sight setting.
Finish:	Black, baked enamel over phosphate.
Furniture:	Laminated wood buttstock, pistol grip, and upper and lower hand guards.
Manufacturer:	Vyatskiye Polyany Machine Building Plant (known as Molot J.S.C.), Vyatskiye Polyany, Russia.
T&E summary:	Possesses the usual Kalashnikov reliability and is accurate enough for the squad automatic role. The only major criticism against it is the lack of a quick-change barrel system and the resultant deficiency for deployment in the sustained-fire role.

ing the selector lever in one of the fire positions. Push in on the rear end of the guide rod, which protrudes from a square hole in the rear of the top cover, and lift off the top cover. Push the guide rod forward and off its retaining slot at the end of the receiver.

Lift it up slightly and withdraw the guide rod and follower from the back end of the bolt carrier. Pull the bolt carrier all the way to the rear and withdraw it from the receiver. Rotate the bolt clockwise until it can be separated from the bolt carrier/piston assembly. The gas cylinder can be removed by inserting the end of the gas cylinder's retaining lever into the narrowest slot on the cleaning kit's tubular container.

By this means rotate the lever upward until the gas cylinder can be lifted out. Use of the cleaning kit container as a pry prevents marring the finish. The usual AK-type cleaning rod will be found under the barrel, but it's longer than the rifle's. After cleaning, lubricate lightly. Never put lubricant of any kind in the gas cylinder or on the piston of any gas-operated weapon. Reassemble in the reverse order.

Use the following ComBloc soldier's trick to simplify the final reassembly steps. Place the rear end of the recoil spring guide rod assembly just in front of and below its retaining slot in the receiver. Hold down on the top cover while retracting the cocking handle. The end of the guide rod will jump into the square hole at the end of the top cover and its retaining slot in the receiver. SGN