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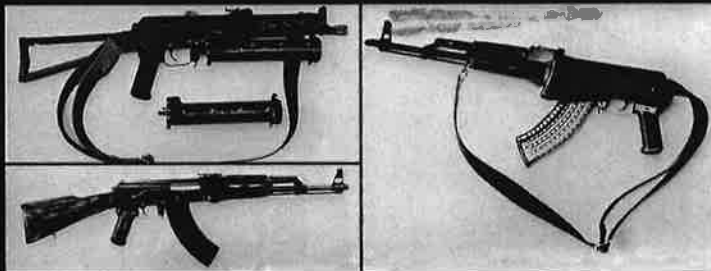
To Defendants' Memorandum in Support of Motion for
Summary Judgment

LEGENDS AND REALITY

AK

A Behind-the-Scenes
Look at the History,
Design, and Impact of
the Kalashnikov
Family of Weapons

VAL SHILIN CHARLIE CUTSHAW



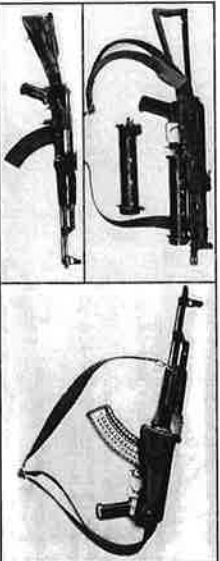
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*Legends and Reality of the AK:
A Behind-the-Scenes Look at the History, Design, and Impact of the Kalashnikov Family of Weapons*

by Val Shulin and Charlie Cushman

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The Kalashnikov Phenomenon



CHAPTER

2

The Russian author of this book is a close associate of Mikhail Timofeyevich Kalashnikov, and over the years Kalashnikov related how he came to be one of the world's premier small-arms designers. Legend has it that Kalashnikov was a tank sergeant who dreamed of seeing Soviet soldiers armed with a new type of submachine gun throwing back the invading Nazi hordes. The young Kalashnikov may indeed have dreamed of sending the invading Nazis either back to Germany or to Hades, but this legend is not quite in accord with the facts. Frankly, I see no congruency between his desires and the facts: he always says it was his strongest motivation to begin designing a fully automatic weapon.

Mikhail Kalashnikov was indeed a tank sergeant who was severely wounded in fighting at Bryansk. He was evacuated to a military hospital in Kazan, about 700 kilometers east of Moscow, to recuperate. While in the hospital Kalashnikov became restless and began to think about designing firearms. He obtained paper and pencil and began setting his thoughts to paper. He thought that he would quickly return to combat, but his wounds did not heal as fast as expected, and Kalashnikov was told to go home for convales-

cent leave. Once his wound had sufficiently healed for him to be released for limited duty, Kalashnikov was sent to Alma-Ata and put to work at a railroad depot. It was in the machine shop of that railroad depot that he created his first prototype submachine gun that authorities sent to the Ordzhonikidze Moscow Aviation Institute, which, like so many other industries west of the Urals, had been evacuated far to the east (in this case to Alma-Ata) to prevent their destruction or capture by the Nazis. The officials at the institute recognized Kalashnikov's innate talent, and although his weapon was not accepted into service, Kalashnikov was transferred from working for the railroad to the machine shops of the Ordzhonikidze Institute. It was there that he produced his second prototype firearm, which was sent to the Dzerzhinskii Ordnance Academy in Samarkand. Again, Kalashnikov's gun was rejected, but it gained national recognition for the budding weapons designer and he was transferred to Shururov, near Moscow, to work at NIPSVMO, the Scientific Test Range for Small Arms and Mortars. This facility dated to 1906 and was an important center for test and evaluation of not only domestic but foreign weapons as well.

The young Kalashnikov not only received "hands on" training in recognition of his abilities, but was sent for formal engineering schooling as well. He worked on modifications to existing Soviet weapons, such as the Goryunov machine gun, which gained him further recognition as a true genius for weapons design. This genius gained Kalashnikov two "author's certificates," the Soviet equivalent of a patent. It was during this period that Kalashnikov met many of the "old school" of Soviet firearms design—among them Degtyarev, Simonov, and Sudaev.

Early in 1944, Kalashnikov was given some M1943 7.62x39mm cartridges and informed that there were several designers working on weapons for this new Soviet small-arms cartridge. It was suggested to him that this new weapon might well lead to greater things, and he undertook work on the new rifle. The rifle that Kalashnikov designed was in the same class as the familiar SKS-45 Simonov with fixed magazine and gas tube above the barrel.

MODEL 1944 SPECIFICATIONS

Caliber, mm:	7.62x39
Overall length, mm: with bayonet extended	1,430
with bayonet folded	1,130
Length of barrel, mm:	558
Magazine capacity, rds:	10
Weight, empty, kg:	3.9

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Figure 26. Experimental Model 1944 autoloading rifle with bayonet folded.

Again, Kalashnikov's design was a loser, but with each passing rejection he was learning more about weapons design, and some of the features of his rifle that lost to Simonov would find their way into Kalashnikov's future designs. Moreover, he continued to get exposure as a premier firearms engineer and at age 25 was working with men such as Simonov who were approaching the end of their productive careers while Kalashnikov was just beginning his.

The SKS was not quite what the Soviet army was seeking, and work continued on a true *assault*, or assault rifle. The desire for a true assault rifle was probably influenced by the success of the German MP43/44/SG44 assault rifle. As usual in the Soviet Union and Russia, a number of designers developed competing assault rifle designs, among them Kalashnikov, Simonov, and Sudaev. The favorite was Sudaev's design, which was already undergoing tests, but which had some major shortcomings, such as being too heavy, but which had some major shortcomings, such as being too heavy. Kalashnikov was a newcomer to this competition but began thinking about how to develop an operating system that could be used in an entire family of small arms—assault rifle, light machine gun, and machine gun. Kalashnikov sent his design off for consideration in early 1946 and very shortly thereafter was advised to proceed with development of a prototype assault rifle.

EXPERIMENTAL AUTOLOADING RIFLE SPECIFICATIONS

Caliber, mm:	7.62x39
Overall length, mm: with bayonet extended	1,320
with bayonet folded	1,020
Length of barrel, mm:	518
Caliber, mm:	7.62x39
Overall length with bayonet with bayonet folded, mm:	1,020
length of barrel, mm:	518
Magazine capacity, rds:	10
Weight, empty, kg:	3.742

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(Top) Figure 27. Experimental Model 1946 assault rifle (right side), designated SK #3 (*skaznyy vzor*) *karabin*, with bayonet folded.
 (Middle) Figure 28. Experimental AK-46, #1 (right side).
 (Bottom) Figure 29. Experimental AK-46, #2 (right side).

EXPERIMENTAL AK-46, #1 SPECIFICATIONS

Caliber, mm:	7.62x39
Overall length, mm:	895
Length of barrel, mm:	397
Magazine capacity, rds.:	30
Weight, empty, kg.:	4.106

EXPERIMENTAL AK-46, #2 SPECIFICATIONS

Caliber, mm:	7.62x39
Overall length, mm:	950
Length of barrel, mm:	450
Magazine capacity, rds.:	30
Weight, empty, kg.:	4.328

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EXPERIMENTAL AK-47, VERSION #1 SPECIFICATIONS

Caliber, mm:	7.62x39
Overall length, mm:	845
Length of barrel, mm:	400
Magazine capacity, rds.:	30
Weight, empty, kg.:	4.408

Figure 30. Experimental AK-47, version #1 (right side).

In response to Moscow's approval, Kalashnikov assembled a small "collective," called a *znan* in Western vernacular, with individual special skills to help hasten the manufacture of the new weapon. The team worked feverishly to get the prototype finished on schedule, and according to Kalashnikov, his team was largely responsible for meeting the schedule. But a weapon that looks good on paper does not always perform on the range, and so it was with the first prototype of the assault rifle that eventually became the AK-47. There were several flaws, but none that caused any delay in the test program. Kalashnikov's assault rifle was produced in limited numbers and sent for troop trials. After passing the troop trials with virtually no difficulties, the rifle was recommended for adoption by the Soviet army.

One of those who worked with Kalashnikov at the time was Alexander Malinon, an officer who came to the Shurovo Test Range in 1943 and participated in virtually all design and experimentation phases of the AK-47 development. Some have disparaged Kalashnikov, essentially claiming that it was his design team that did the work, while Kalashnikov took the credit. In preparation for this book, we interviewed one of Kalashnikov's associates from those days at his home in Izhevsk, and he put the lies to any such claims. Kalashnikov's old friend, who requested anonymity, stated categorically that as far as he was concerned, Kalashnikov is a natural-born weapons designer. Further, the

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(Top) Figure 31. The AK-47 assault rifle, experimental version #3 (right side).
 (Bottom) Figure 32. AK-48 experimental version #1 (right side).

Chief Missile and Artillery Department (GRAU) saw to it that Kalashnikov received the technical support that he needed to get the job done. In addition, Kalashnikov was literally tireless: his friends sometimes referred to him as *perpetuum mobile*, perpetual motion. By combining genius and hard work, Kalashnikov met and overcame every challenge.

AK-47 ASSAULT RIFLE, EXPERIMENTAL VERSION #3 SPECIFICATIONS

Caliber, mm: 7.62x39
 Overall length, mm: 875
 Length of barrel, mm: 400
 Magazine capacity, rds.: 30
 Weight, empty, kg: 4.091

AK-48, EXPERIMENTAL VERSION #1 SPECIFICATIONS

Caliber, mm: 7.62x39
 Overall length, mm: 870
 Length of barrel, mm: 415
 Magazine capacity, rds.: 30
 Weight, empty, kg: 4.15

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EXPERIMENTAL AK-48 ASSAULT RIFLE VERSION #4 SPECIFICATIONS

Caliber, mm: 7.62x39
 Overall length, mm: 875
 with stock extended
 with stock folded 635
 Length of barrel, mm: 400
 Magazine capacity, rds.: 30
 Weight, empty, kg: 4.23

7.62x39

(Top) Figure 33. The experimental AK-48 assault rifle version #4 model for airborne troops, with the steel-frame folding buttstock.
 (Bottom) Figure 34. The AK-47 issue weapon (right side) developed for motorized infantry, with wooden stock.

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Figure 35. The AK-47 assault rifle (left side).

AK-47 ASSAULT RIFLE SPECIFICATIONS

Caliber, mm:	7.62x39
Overall length, mm:	870
Length of rifled barrel, mm:	415
Length of rifled bore, mm:	369
Sighting radius, mm:	378
Number of right-handed (RH) riflings:	4
Cyclic rate of fire, rpm:	600
Combat rate of fire, rpm:	90-100
single shots	400
Muzzle velocity, m./sec.:	700
Killing range, m.:	1,500
Magazine capacity, rds.:	30
Weight, empty, kg.:	4.300

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AKS-47 SPECIFICATIONS

Overall length, mm:	870
with buttstock extended	870
with buttstock folded	645

(Top) Figure 36. The AKS-47 assault rifle with folding stock.
 (Bottom) Figure 37. AKS-47 (left side) with buttstock extended.

Examination of the early AK prototypes reveals that they had a short bolt carrier with a separate operating rod. One of Kalashnikov's competitors, Boulkin from Tula, had a rifle with a different design for the bolt carrier and return mechanism. Unfortunately, Boulkin's design had the bolt guide cams at the rear of the bolt carrier rather than the front, requiring greater forces to unlock and lock the bolt. Kalashnikov noted that Boulkin's design could be improved upon by moving the cams to the front of the bolt carrier while retaining Boulkin's return system. In the interval between tests, Kalashnikov changed his design by incorporating some of Boulkin's features, resulting in the rifle that is known as the AK-1. From this model on, all AK designs feature a bolt carrier with integrated operating rod and piston, along with charging handle attached to the bolt carrier. The AK-1 also marks the introduction of the now familiar

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Kalashnikov selector lever of stamped steel on the right side of the receiver. This model also has a recoil compensator integral to the barrel, the three holes located just behind the front sight.

During this period, Kalashnikov worked at both Tula and Kovrov but was unhappy at both locations, probably because his genius was overshadowed and restrained by the likes of Tokarev and Simonov at Tula and General Degtyarev at Kovrov. In fact, most traditional arms production facilities had their resident doyens of small arms, who did not look kindly upon a young tank sergeant who admittedly had genius but had not paid his dues by long experience. Casting about for a place where he would be appreciated, Kalashnikov was offered an engineering position at Izhevsk, which had a tradition of small-arms manufacture but little experience in the production of automatic weapons. Kalashnikov accepted the offer and moved to Izhevsk in 1948, where he took up residence at Izhevsk Motor Plant #524. The factory had nothing to do with the manufacture of engines but was in fact a weapons factory. The "motor plant" designation was a cover, commonly used by the Soviet government of the time. By this time, production of the AK-47 had already been undertaken on a limited basis at Tula, but the weapon had still not been formally "type-classified." Indeed, weapons produced during this period are actually pre-production rifles.

In January 1948, both Izhmash (Izhevsk Machine Engineering Plant #74) and Izhmekh (Izhevsk Mechanical Plant #622) were supporting Motor Plant #524 by manufacturing components for the new assault rifle. In early 1948, Izhmash produced its first four rifles and tested them for durability. Each fired more than 13,000 rounds before testing was terminated due to the fact that all on-hand ammunition stocks had been consumed. The rifles performed almost faultlessly, with less than 0.5 percent failures, most of which were attributable to misfires. These results were reported to the Ministry of Armaments, which was satisfied with the results and on 5 May 1948 issued an order that directed the transfer of rifle production from Motor Plant #524 to Factory #74, Izhmash. This order became effective in the first quarter of 1949.

The transition began, but for some time both factories were simultaneously producing AK-47 rifles. Despite transitional difficulties, the two facilities produced more than 80,000 rifles by the end of the year. It was at this time, however, as full-scale production of the AK-47 was just getting under way, that a major problem arose—one that would change the basic design of the AK-47

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Figure 36. The AK-49 assault rifle. This model features the following modifications: the barrel extension is removed, the recesses were made right in the receiver, and the receiver is made by drop-forging and machining.

Much has been made of the fact that in late 1950, the AK-47 receiver was changed from sheet metal to machined steel. Many reasons for this change have been given over the years, ranging from reliability problems with the sheet metal receivers to assembly problems during manufacture. The latter is actually the real cause behind the changeover.

The AK-47 was designed in the days before computer numerically controlled machinery, and tolerances with welded assemblies were problematic. The Soviet assembly lines of the time could not provide welds that met tolerances, especially for internal components. As production rose, so did the number of rejected receivers. The problem was manageable when the rifles were essentially in a preproduction status, but once full production got under way, the welds simply could not be held to necessary tolerances.

A team of process engineers headed by Valery Kharukov was established to design and implement the manufacture of a forged and milled receiver. The forged receiver "Type IV" AK-47 was developed, tested, accepted, and introduced into production by the end of 1949, and production of both "Type I" and "Type II" AK continued into 1951, as it took that long to get the production lines fully changed over to the new procedures. An interesting point is the fact that the forged receiver AK-47 was actually tested and type-classified by the Soviet Ministry of Defense as the AK-49. So if one wishes to be historically exact, the AK-47 officially went out of production in 1951 and was replaced by the AK-49!

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(Top) Figure 39. The experimental AK-50 Model 1949/50 assault rifle (right side) with wooden stock and folding bipod.
 (Bottom) Figure 40. Model 1950 experimental assault rifle with additional pistol grip and a telescopic metal monopod.

EXPERIMENTAL AK-50 SPECIFICATIONS

Length of bipod, mm (in.): 290 (11.4)
 Weight, empty, kg (lbs.): 4.508 (9.9)

EXPERIMENTAL MODEL 1950 SPECIFICATIONS

Length of monopod, mm: 235 (9.25)
 Weight, empty, kg: 4.491 (9.9)

This new production methodology had both positive and negative effects at Izhmash. On the debit side, the machined receiver dramatically increased production costs due not only to labor costs but to material expenses as well. The receiver of the AK-49 began as a solid 2.65-kilogram (5.8 pound) block of steel. More than 120 machining operations later, the outcome was a finished receiver weighing only 650 grams (1.43 pounds). More

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than 80 percent of the original high-grade ordnance steel was wasted in production! On the positive side, the reliability of the AK-49 was even greater than the original AK-47. This positive aspect, however, did not offset the inherent inefficiency of the machined receiver, and Izhmash process engineers continued to search for ways to reduce production costs while maintaining the reliability and robustness of the AK rifle. A process team under the leadership of Mikhail Miller was established to reduce weight and production costs of the weapon. The result of their four-year effort was a rifle that eventually became the definitive AK—the AKM.



Figure 41. The AKS experimental light assault rifle, standard version.

AKS EXPERIMENTAL LIGHT ASSAULT RIFLE SPECIFICATIONS

Overall length, with stock extended, mm: 1,076

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(Top) Figure 42, Model 1952 experimental automatic rifle, version #1.
 (Bottom) Figure 43, Model 1955 experimental automatic carbine, version #4.

EXPERIMENTAL MODEL 1952 SPECIFICATIONS

Caliber, mm: 7.62x39
 Overall length, mm (in.): 1,155 (45.5)
 with bayonet 975 (38.4)
 without bayonet 485 (19.9)
 Length of barrel, mm (in.): 30
 Magazine capacity, rds.: 30
 Weight, empty, kg. (lbs.): 4.204 (9.25)

EXPERIMENTAL MODEL 1955 SPECIFICATIONS

Caliber, mm: 7.62x39
 Overall length, mm (in.): 1,065 (41.9)
 with bayonet 870 (34.2)
 without bayonet 415 (16.3)
 Length of barrel, mm (in.): 310 (12.2)
 Length of bayonet, mm (in.): 375 (14.7)
 Sighting radius, mm: 30
 Magazine capacity, rds.: 30
 Weight, empty, kg. (lbs.): 2.992 (6.6)

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EXPERIMENTAL AK ASSAULT RIFLE

Caliber, mm: 7.62x39
 Overall length, mm (in.): 880 (34.6)
 Length of barrel, mm (in.): 415 (16.3)
 Magazine capacity, rds.: 30
 Weight, empty, kg.: (lbs.) 3.1
 Cyclic rate of fire, rpm: 600

The weapon features the following innovations:

- The rate reducer increased accuracy of fire.
- The point of impact of the bolt carrier in its forward position upon entering battery was transferred from right to left, thereby enhancing the weapon's horizontal balance.
- The sighting range was increased from 800 to 1,000 meters.

Caliber, mm: 7.62x39
 Overall length, mm (in.): 870 (34.2)
 Length of barrel, mm (in.): 415 (16.3)
 Length of rifled bore, mm (in.): 369 (14.5)
 Sighting radius, mm: 378 (14.8)
 Number of RH riflings: 4
 Cyclic rate of fire, rpm: 600
 Combat rate of fire, rpm: 40
 single shots 100
 bursts 1,500
 Killing range, m.: 1,500
 Magazine capacity, rds.: 30
 Weight, empty, kg. (lbs.): 3,100 (6.8)

Figure 44, Model 1952 experimental AK assault rifle (right side) with AG-48 thermosetting plastic stock and forged and machined receiver.

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Figure 45. AKM equipped with bayonet. The AKM was the first version of the Kalashnikov to be equipped with the now-familiar wire-cutting bayonet.

An early result of the Miller team's efforts, however, was what is known in the West as the "Type III" AK-47. This AK variant appeared in 1953 and was the most widely produced AK-47/49 variant. Although the receiver was still machined, the process was simplified. A major change was the stock base, which is integral to the receiver rear. The earlier AK had a separate attaching block, which itself required a number of complex machining operations. The ribbed-steel magazine was also introduced with the "new" AK in 1953 and would remain standard until adoption of a phenolic magazine for the AKM in the 1960s. The Type III marks the first time the AK was produced under license outside the Soviet Union. Bulgaria and East Germany began producing the rifles in 1959. Hungary began production in 1958. Poland and Chinese production got under way in 1956. North Korea began in 1958. Yugoslavia undertook manufacture in 1964. It is interesting to note that only in the West were AK types denoted. The Soviet Union never differentiated between the three different variants of the AK-47/49.

The efforts of the process team did not result in a new rifle overnight. Once they had simplified the production process of the machined receiver AK, the team members began to examine alternatives. There were a number of experimental rifle designs derived from the original AK, as shown in the accompanying photographs. Ultimately, the goal was to develop a rifle that had even further improvements over the original design, and experiments to this end were undertaken in the early 1950s. Several experimental rifles were developed along the same basic pattern. The first of these was the Model 1952, which featured a shortened gas system and a change of the selector switch to a rotating type on the left side of the receiver, where it could be manipulated by the shooter's thumb. The receiver of this rifle

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was still machined. Several versions of this type of experimental rifle were developed, and some features were eventually incorporated into the AKM, most notably the laminated stock that proved to be much stronger and more resistant to splintering than solid wood. This direction of rifle development culminated in the Model 1955 experimental rifle, which differed from earlier versions by the presence of a sheet metal receiver and the return of the rotating selector switch to the right side location.

TABLE OF COMPARISON

	Navy SEALs knife	AKM bayonet
Overall length, mm (in.):	246 (9.7)	278 (10.9)
Length of blade, mm (in.):	140 (5.5)	148 (5.8)
Width of blade, mm (in.):	30 (1.18)	30 (1.18)
Weight, with scabbard, kg (lbs.):	0.342 (0.75)	0.450 (1.0)
Weight, without sheath, kg (lbs.):	0.267 (0.59)	0.284 (0.63)



Figure 46. The AKM assault rifle equipped with the NSPU2 night scope.

AKM ASSAULT RIFLE

Overall length, mm:	880
with buttstock extended	
with buttstock folded	640

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Figure 47. AKMs with experimental 100-round detachable stamped-and-welded magazine

It was believed for many years that this 100-round magazine was designed in the 1960s. In our conversations with Valeriy Paratin, a leading expert in AK weapons of Izhmash's Arms Design Center, we were shown a prototype with a stamped marking 1957. Paratin told us that in the 1950s there was a strong tendency in the Soviet arms industry for developing and testing various large-capacity magazines, but by the 1960s, this tendency had run its course and large-capacity magazine experiments were abandoned.

By the late 1950s the Izhmash process engineers had overcome most of the production problems of the early AK rifles and intervening experiments revealed that not only could a sheet-metal receiver now be economically produced, but several other changes in the basic AK design were desirable. This resulted in the AKM (Автомат Калашникова Модернизированный). The AKM had several improvements over the Type III AK-47/49. A "hammer delay" retarded hammer movement forward in full-automatic fire, reducing the cyclic rate and thereby improving accuracy. This is reflected in the recalibration of the rear sight from a maximum range of 800 meters to 1,000 meters. The two indentations on the side of the receiver serve as magazine guides to assist in quick reloading under the stress of combat. The buttstock was changed from solid wood to a laminated construction. This was done because the solid wood stocks of the AK47/49 rifles were less resistant to severe shocks and were subject to cracking. The AKM also was fitted with a muzzle compensator that helped prevent muzzle climb on full-automatic fire.

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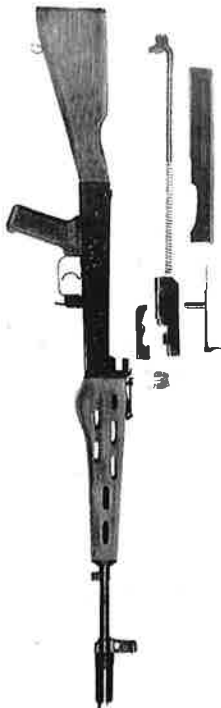


Figure 48. The experimental AK assault rifle (early 1970s). The rifle has a delayed-blowback bolt. The bolt is delayed in its rearward motion by a special double-shouldered lever attached to the bolt.

The AKM was also the first rifle to be fitted with the now-familiar multipurpose bayonet. The development of this innovative bayonet knife—which inspired others to develop similar bayonets, notably, the U.S. M9—came to light during research for this book. The prototype was designed by a World War II veteran Soviet naval officer named Todorov in 1955 for use by navy SPETSNAZ forces. Todorov's knife had a built-in wire cutter that could not only cut wire, but steel rods as well. The knife also had a sawback upper edge. Mikhail Kalashnikov kept the best features of the knife and modified the design by adapting it to fit the rifle's bayonet lug, making the scabbard the second half of the wire-cutting shears and insulating both it and the knife blade to prevent shock in the event the soldier had to sever live wires. The design was good enough that when the German army adopted the Fiedler & Koch G36, the AK bayonet was specified. This was also an economic measure, as there were thousands of East German AK bayonets remaining after Germany was reunified.

The search for improvements to the Kalashnikov design continued after the introduction of the AKM in 1959. The early 1960s saw experiments with plastic furniture, magazines, and different types of operating systems. One such design was the experimental rifle shown in Figures 48 and 49:

EXPERIMENTAL AK ASSAULT RIFLE

Caliber, mm:	7.62x39
Overall length, mm (in.):	945 (37.2)
Length of barrel, mm (in.):	475 (18.7)
Magazine capacity, rds:	30
Weight, empty, kg (lbs):	2.8 (6.2)
Cyclic rate of fire, rpm:	600

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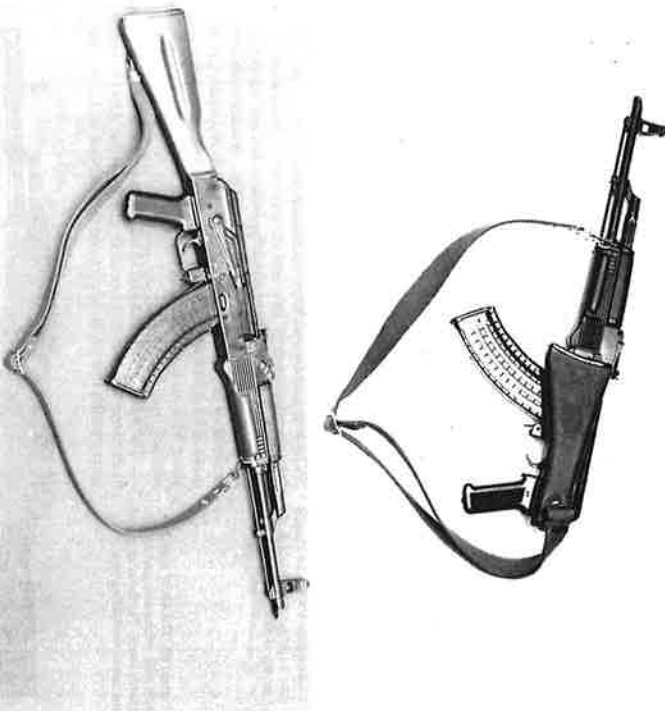


Figure 49. The AKMS assault rifle (right side) with experimental plastic folding stock and handguard and with stock extended.

The AKMS rifle incorporated delayed-blowback operation in place of the traditional Kalashnikov gas operation. Delay was provided by the double-shouldered block shown just below the bolt in the illustration. This experimental rifle, shown for the first time in this book, was stimulated by rifle designs by Korobov, who worked at Tula KBP during the 1960s and 1970s. Korobov designed a delayed-blowback rifle that achieved better accuracy than the AKM. In addition, it had only 65 parts and was less expensive to manufacture than the AKM, which had 97 components. Kalashnikov and his design team—consisting of V. Krupin, A. Krikushin, and V. Pushin—developed this delayed-blowback-operated rifle in response, and after testing, the conclusion was that while the new design would be cheaper to produce than the AKM, it was greatly inferior in terms of durability and overall effectiveness.

As we have seen, the search for improvements to the AKM continued after the rifle's introduction and eventually led to the AK-74. How this came about is another story that has never been told and actually begins at Klimovsk and TsNIITochmash, another major Russian arms manufacturer. During the period immediately after the introduction of the AKM (i.e., in the mid-1960s), TsNIITochmash was working on a new 5.6x41mm cartridge under the leadership of Lidia Bonchitskaya. At the same time Izhmash was also conducting research on new types of automatic weapons. In point of fact, the Soviet military was not completely happy with the performance of the Kalashnikov rifle's durability and reliability were, of course, legendary, but conscript troops had difficulty managing the recoil of the 7.62x39mm M1943 cartridge and controlling the AKM under full-automatic fire, even with the rudimentary compensator.

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(Top) Figure 50. Experimental AKMS (left side) with buttstock folded.

About the same time, the effectiveness of the U.S. AR-15/M16 began to become widely known, which assured the TsNIITochmash researchers that they were on the right track.

The 5.6x41mm cartridge was designated 13MZh, and although it was dimensionally quite different from the 7.62x39mm cartridge, its head dimensions were identical. Work continued on the smaller caliber cartridge, eventually resulting in the current standard 5.45x39mm 13MZhV, which appears to be little more than a necked-down version of the 7.62x39mm round. As we have seen, this was not the case.

(Bottom) Figure 51. Experimental AKM with non-folding plastic buttstock. Note the resemblance to current versions of AK-100 series.

(Bottom) Figure 51. Experimental AKM with non-folding plastic buttstock. Note the resemblance to current versions of AK-100 series.

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13MZH CARTRIDGE SPECIFICATIONS

Model	Model 1974, 5.45x39mm
Overall length, mm:	57.0
Length of case, mm:	38.6
Length of bullet, mm:	25.5
Weight of cartridge, g (gr.):	10.2 (157.4)
Weight of bullet, g (gr.):	3.4 (53)
Muzzle velocity, m/sec. (fps):	900 (2,953)
Cartridge chamber displacement, cc:	1.56
Maximum gas pressure, kg/sq. cm.: 3,000	3,000

While Lidia Boulavskaya's TSNITtochmash group worked on the new cartridge, Izhmash assigned two engineers—Nesterov and Alexandrov—to work closely with her to develop a version of the AKM chambered for the new round. Alexandrov and Nesterov eventually designed 5.45x39mm versions of both the AKM and AKMS that were in essence prototypes of the AK-74. Design work on both rifle and ammunition was finished by 1970, but the new rifle was not type-classified and adopted for service until 1974. This was because of an advanced combat rifle designated the AL-7, which was simultaneously under development at Izhmash. We shall see more of this advanced rifle later, along with an explanation as to why the less effective AK-74 was selected over it.

The AK-74 was changed in many ways besides caliber from its predecessor. The most notable change is the AK-74 muzzle brake, which not only reduces recoil, but blast and noise levels



as well. The recoil of an AK-74 with muzzle brake in place is almost half that of an M16A1 and reduced by nearly two-thirds in comparison with the AKM. The combination of the 13MZh cartridge and the new muzzle brake resulted in a weapon that has nearly twice the effective range of its predecessor. In addition, the soldier can carry almost 50 percent more 5.45x39mm than 7.62x39mm cartridges or a given weight.

AK74 ASSAULT RIFLE SPECIFICATIONS

AK74 ASSAULT RIFLE SPECIFICATIONS	5.45x39
Caliber, mm:	5.45x39
Overall length, mm (in.):	943 (37.1)
Length of barrel, mm (in.):	415 (16.3)
Length of rifled bore, mm (in.):	372 (14.6)
Sighting radius, mm (in.):	379 (14.9)
Number of RH riflings:	4
Cyclic rate of fire, rpm:	600
Combat rate of fire, rpm:	40
single shots	100
bursts	1,350
Killing range, m:	30
Magazine capacity, rds.:	3,400 (7.5)
Weight, empty, kg. (lbs.):	

THE KALASHNIKOV PHENOMENON

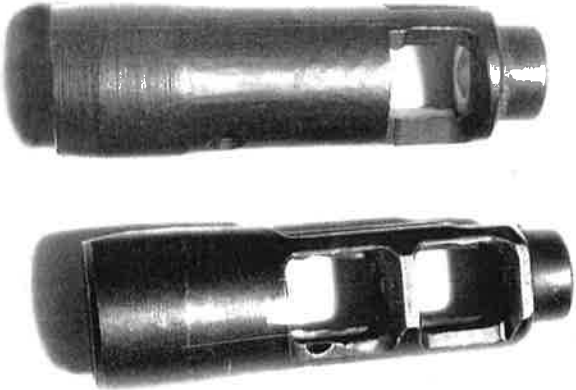


Figure 53. AK-74 with burststock folded and equipped with experimental muzzle brake with two side slots.

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(Top) Figure 54. The AK-74(A) assault rifle outfitted with the "Yul" part scope and a two-slotted muzzle brake. The plastic buttstock is unfolded.



(Bottom) Figure 55. Muzzle brakes for the AK-74M assault rifle: with one side slot and with two side slots.

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Original AK-74 rifles were issued with the laminated wood fixed stock of the AKM, but the Soviets were experimenting with polymer furniture in the 1960s, and manufacture of the AK-74 with plastic furniture began shortly after the introduction of the rifle in 1974. AK-74s were equipped with red polymer magazines from the time of their introduction. The latest version of the AK-74, the AK-74M, is actually marketed as part of the AK-100 series and indeed is the prototype for that new series of Kalashnikov rifles, which incorporate all the improvements of the AK-74M into rifles chambered in both 7.62x39mm and 5.56x45mm.

(Top) Figure 56. AK-74M (left side) with the "Yul" part scope, bayonet, and a clip of ammunition. The buttstock is unfolded.

(Bottom) Figure 57. AK-74M (right side) equipped with the NSPU3 night scope, the 40mm 6G15 underbarrel grenade launcher, and a bayonet.

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(Top) Figure 58. AK-74M with the NSPU3 night scope, bayonet, and a dipload of ammunition.
 (Bottom) Figure 59. AK-74M field-stripped.

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AK-74M SPECIFICATIONS

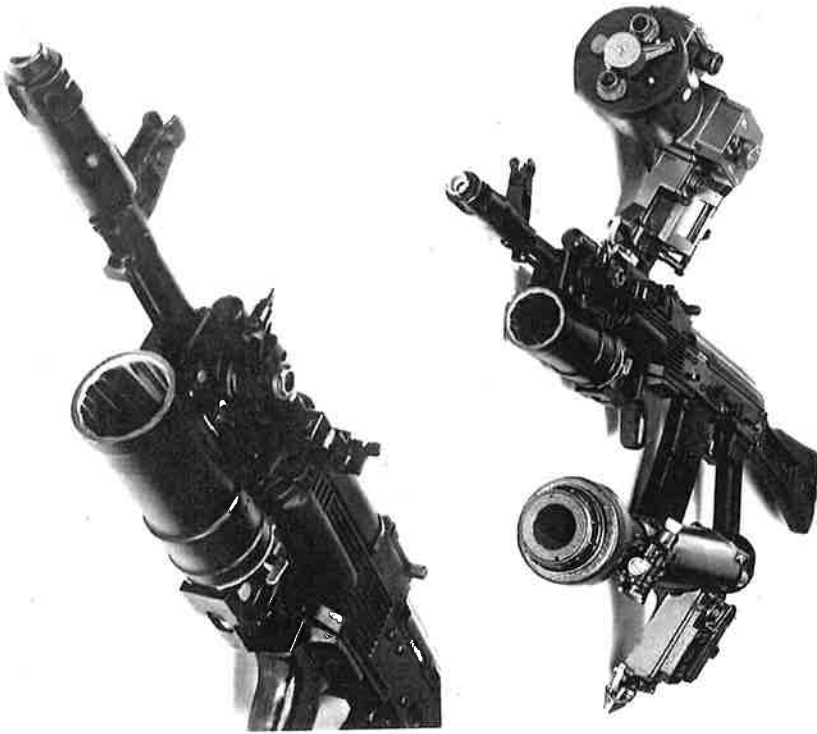
Caliber, mm:	5.45x39
Overall length, mm (in.):	730 (28.7)
with stock extended	490 (19.3)
with stock folded	210 (8.3)
Length of barrel, mm (in.):	20/30
Magazine capacity, rds:	2/71 (6.0)
Weight, empty, kg (lbs.):	600
Cyclic rate of fire, rpm:	

The "new generation" Kalashnikovs include not only the AK-74M, but the AK-101 through AK-105 rifles as well. There is no rifle actually designated AK-100—this is a generic term for the entire series. Why the AK-100 designation? It wasn't by chance that Izhmash chose AK-100 for its new family of assault rifles. The AK, of course, stands for Avtomat Kalashnikova—the Kalashnikov assault rifle. The number 100 is an old production code for the Izhmash factory. Thus, the designation at once identifies the manufacturer and the designer. The AK-74M and AK-105 are both 5.45x39mm. The AK-101 and AK-102 are 5.56mm NATO, and the AK-103 and AK-104 are 7.62x39mm. The AK-74M, AK-101, and AK-103 are standard rifles, while the AK-102, AK-104, and AK-105 are truly carbines—short-barreled versions of the full-length assault rifles. All rifles and carbines in the AK-100 series have standard mounts for optics and night vision devices, folding stocks of black polymer, and black phosphate finish. Carbines may be readily identified by their AKS-74U type muzzle brake. The AK-107 and AK-108 are different and will be discussed separately.

Figure 60. AK-101 with butt-stock unfolded, accessories, and bayonet.

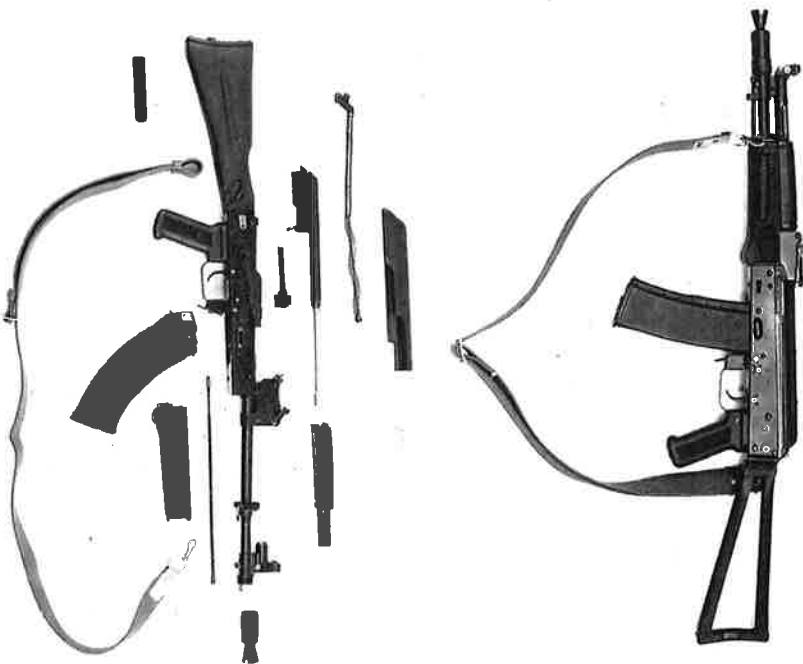


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(Top) Figure 61. All the weapons of the AK-100 series are fully compatible with Russian issue accessories, including various night scopes and 40mm underbarrel grenade launchers.
(Bottom) Figure 62. AK-101 equipped with the 40mm 6G15 underbarrel launcher.

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(Top) Figure 63. AK-102 with steel frame-type buttstock extended.
(Bottom) Figure 64. AK-104 field-stripped.

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The AKS-74U was a special case. The compact assault rifle has been referred to elsewhere as a submachine gun, but this is not the case: a submachine gun by definition fires pistol-caliber cartridges. The AKS-74U was chambered for 5.45x39mm rifle cartridges, so it was more properly called a compact assault rifle. Regardless, while the AKS-74U was designed by the Kalashnikov Bureau at Izhmash, the weapon was actually manufactured at Tula KBF (production of the AKS-74 stopped in the early 1990s; those still in use are surplus). It is primarily used by Russian law enforcement personnel rather than the military, although some AKS-74U weapons are used by SPETSNAZ.

AK-74M, AK-101, AND AK-103

Designation	AK-74M	AK-101	AK-103
Caliber, mm:	5.45x39	5.56x45	7.62x39
Cyclic rate, rpm:	600	600	600
Sighted range of fire, m.:	1,000	1,000	1,000
Muzzle velocity, m/sec. (fps):	900 (2,953)	910 (2,986)	715 (2,346)
Weight of bullet, g. (gr.):	3.42 (53)	4.0 (62)	7.9 (122)
Weight, empty, w/o magazine, kg. (lbs.):	3.4 (7.5)	3.4 (7.5)	3.4 (7.5)
Weight of magazine, empty, kg. (lbs.):	0.23	0.23	0.25
Magazine capacity, rds.:	30	30	30
Rate of twist, mm (in.):	180 (7.85)	180 (7.08)	240 (9.4)
Barrel length, mm (in.):	415 (16.3)	415 (16.3)	415 (16.3)
Length, overall, mm (in.):	700 (27.5)	700 (27.5)	700 (27.5)
with folded stock			
with extended stock	943 (37.1)	943 (37.1)	943 (37.1)

Operation: Gas operated without a regulator, locked-breech with a rotary bolt, fires from the closed-bolt position.
 Barrel: Chrome-lined bore and chamber; four grooves, RH-twist.
 Sights: Front—round-post-type with protective ears
 Rear—sliding tangen-type with an open U-notch
 Furniture: Butstock, pistol grip, forearm, handguard made of black fiberglass-reinforced polyamide
 Set of delivery: Submachine gun; four magazines; bayonet; cleaning kit including cleaning rod and oiler; sling; pouch; operational and service manual; catalog of spare parts
 Optional accessories: Optical sights and night vision devices

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AK-102, AK-104, AK-105, AK-107/AK-108

Designation	AK-102	AK-104	AK-105	AK-107/108
Caliber, mm:	5.56x45	7.62x39	5.45x39	5.45x39/5.56x45
Cyclic rate, rpm:	600	600	600	850-900 rd./min.
Sighted range of fire, m.:	1,000	1,000	1,000	1,000
Muzzle velocity, m/sec.:	850 (2,789)	670 (2,198)	840 (2,756)	840/850
Weight of bullet, g.:	4.0 (62)	7.9 (122)	3.42 (53)	3.4/4.0
Weight, empty and without magazine, kg.:	3.0 (6.6)	2.9 (6.4)	3.0 (6.6)	3.6 (7.2)
Weight of magazine, empty, kg.:	0.23 (5)	0.25 (6)	0.23 (5)	0.23
Magazine capacity, rds.:	30	30	30	30
Rate of twist, mm (in.):	180 (7.08)	180 (7.08)	240 (9.44)	200/178 (7.87)
Barrel length, mm (in.):	314 (12.3)	314 (12.3)	314 (12.3)	415 (16.3)
Length, overall, mm: with folded stock	586 (23.1)	586 (23.1)	586 (23.1)	695 (27.3)
with extended stock	824 (32.4)	824 (32.4)	824 (32.4)	943 (37.1)

Operation: Gas operated without a regulator, locked-breech with a rotary bolt, fires from the closed-bolt position.
 Barrel: Chrome-lined bore and chamber; four grooves, twist.
 Sights: Front—round-post with protective ears
 Rear—sliding tangen-type rear sight with an open U-notch
 Furniture: Butstock, pistol grip, forearm, handguard made of black fiberglass-reinforced polymer
 Basic equipment: Rifle; four magazines; bayonet; cleaning kit including cleaning rod, and oiler; sling; pouch; operational and service manual; catalog of spare parts
 Optional accessories: Optical sights and night vision devices

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The AK-107 and AK-108 assault rifles in 5.45x39mm and 5.56x45mm, respectively, are probably the final development in the Kalashnikov assault rifle saga. Their genesis actually begins in the 1960s with the AL-7 balanced recoil system described in Chapter 3. The functioning of the balanced recoil system is described in detail in that chapter so we will not go into it here. Suffice it to say that the differences between the AK-107/108 and AL-7 of the early 1970s are cosmetic, save for the 3-round burst feature of the newer rifles. Essentially the receiver cover of the AK-107/108 is smooth rather than ribbed, and the selector switch now has a fourth position for burst fire. This can be seen in the closeup of the AK-107 receiver in Figure 64B. Internal operating features of the AK-107/108 are identical to the AL-7 in Figures 104 through 107, except for the burst feature.

The burst feature of the AK-107/108 is accomplished by a ratchet and pawl, with the ratchet as part of the sear mechanism. The ratchet has three teeth that move into position to interact with the pawl on the bolt carrier, at the same time disabling the disconnecter. When the trigger is squeezed, the pawl on the bolt carrier moves the ratchet one tooth, preventing the sear from catching the hammer. As the third round is fired, the ratchet is released and returns to its original position—releasing the disconnecter, allowing the sear to catch the hammer, and thereby interrupting the operating cycle. When the trigger is released, the ratchet returns to its original position and is reset. This provides a 3-round burst each time the trigger is squeezed, even if only one or two rounds were fired in the preceding burst.

Why resurrect and produce a design that is essentially 30 years old? There are a number of reasons. First, sales of AK-100 rifles are bad, but rather a reflection that they offer little improvement in accuracy over their predecessors. Despite the introduction of AKs in 5.56mm NATO former Warsaw Pact nations are no longer candidates for Russian small arms. They are either rebuilding their own small-arms industries, in many cases manufacturing their own rifles or buying rifles from Western sources. Moreover, Kalashnikov rifles can be purchased for approximately US\$50 in some parts of sub-Saharan Africa, while a new AK-101 costs approximately US\$230 for Izhmash. Again, although the AK-100s are modernized, they do not offer significant performance improvements over their predecessors. The new AN-94 is a dramatic improvement over the AK-100s, but the new rifle costs some five times more to produce than an AK-101!



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Figure 64A. AK-107/108.

It became apparent to Izhmash managers that simply marketing AKs with polymer furniture and NATO calibers would not result in sales. Not only was the AN-94 too expensive to be really competitive, it was not yet fully fielded in the Russian army. What might sell, Izhmash managers reasoned, was a version of the proven AK design that offered significant improvements while maintaining traditional Kalashnikov reliability and simplicity with only a marginal increase in price. According to Izhmash, the AK-107 and AK-108 achieve 1.5 times the accuracy of their standard AK-100 counterparts using identical ammunition. This is nearly up to the level of the AN-94! The rifles are too new for sales to be evaluated, but the balanced automatic system that they incorporate should theoretically, at least, deliver the results claimed in Izhmash marketing literature.

And so the story of the Kalashnikov is brought to the present. The versions of the world's most successful military rifle described in this book are probably the last. The Kalashnikov rifle was designed for another era—another time—and for soldiers in an army that is far different than the one that exists today. To that end, the modern Russian military has chosen a successor to the venerable Kalashnikov—the AN-94 Nikonov. The AN-94 itself signals the end of an era in that its advanced features signal a new direction in Russian small-unit doctrine and tactics. It will be many years before the AN-94 is fully deployed in the hands of the entire Russian military, and until that time comes, the AK-74 and other Kalashnikov rifles will form the backbone not only of the Russian army but many others as well. And even when the Kalashnikov is no longer in Russian military service, the features that made it the most wide-

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by proliferated rifle in military history will ensure its presence on the battlefields of the world for the foreseeable future.

In any history of Izhmash, the question of Kalashnikov exports as high as 100 million have been quoted, but this is overstating the case. If one counts every country that has made imitations or "improved" versions of the entire AK-series of weapons from the original AK-47 through the current AK-100 series and such weapons as the Israeli Galil, then the number might approach 100 million, but this is unlikely. The fact is that nobody really knows just how many Kalashnikov-type rifles were exported from the Soviet Union during the Cold War. This may seem unlikely, but it is nonetheless true.

In 1976, when the Russian coauthor of this book was promoted to Chief of the Export Department at Izhmash, he began trying to determine how many AK rifles had been exported from 1979 to 1989, who bought them, and the prices charged. He met with a stone wall of secrecy. In fact, he was told that those sales figures were a state secret of the highest classification. Not to be discouraged, our intrepid investigator kept at the export bureau-crazy until he got to the truth, which was astounding! After years of being told that the Izhmash rifles and machine guns were the best-selling items in the Soviet export program, the fact was that the Soviet government was essentially giving the weapons away. Many "sales" were outright gifts to friendly nations, while others were on long-term credit—sometimes as long as 99 years. Of course, the Soviet government had paid Izhmash the wholesale price, plus three percent as an export bonus, but that was it. So the fact is that the weapons did not really sell at all, but were for all intents and purposes giveaways. Does this bring any discredit to the weapons? Not at all. While the Russian coauthor was in Vietnam, where he can assure the his American colleague was in Vietnam, where he can assure the reader that the durability and reliability of the Kalashnikov rifles were legendary—whether they were Soviet AK47s, AKMs, or Chinese Type 56 rifles. Their cost to the Vietnamese is irrelevant.

The fact was that as far as the Soviet Union was concerned she was at war with the West in general and the United States in particular. The Cold War was a time of great trial, and the Soviets needed new types of small arms with the capacity for massive automatic fire and Kalashnikov delivered the goods! The Kalashnikov weapons—the AK rifles, the RPK light machine guns, and the PK machine guns—were the right weapons at the time, and they performed admirably. They continue to do so today. So we return to our original question... how many AKs were

manufactured by Izhmash? As we said, nobody is really sure, but our best estimate is approximately four million. This does not include AKs that were manufactured in other countries. If these are included, the total runs to approximately 50 million AKs of all types—AK47, AKM, and AK74. Once again, this does not include rifles that were derived from the Kalashnikov design, such as the Israeli Galil, Finnish Valmet, South African R4, and others.

AK-BASED CIVILIAN FIREARMS

Izhmash is a very diverse manufacturing company producing not only military small arms, but civilian firearms as well. In the days of the Soviet Union, official hunters could make requests for development of new small arms in a process similar to that of the military. One such firearm is the "Tiger Carbine," a civilian version of the SVD Dragunov. Less well known, though, is the Karabin Skladnoy (Ukorochenny)—Short Folding Carbine that was developed at the request of professional hunters in Kazakhstan. The hunters had just concluded a contract with the government of Kazakhstan to kill and export the hides of a large number of Saiga antelope, an animal that is extremely abundant in Kazakhstan. Of course, the wholesale slaughter of antelope in the West would become a cause celebre for the animal rights activists, but not in the Soviet Union of the 1970s. At any rate, the hunters wanted a number of reliable semiautomatic 7.62x39mm carbines with high-capacity magazines. Because many of the hunters spent lengthy amounts of time out in the wild, some carbines were made up with folding stocks for convenient carry in the field. This version was designated the KSU.

KS and KSU

Izhmash produced a small number of both versions of the semiautomatic carbines and then went back to exclusive manufacture of select-fire weapons. From the accompanying photos, it is clear that the KS and KSU are essentially semiautomatic-only versions of the AKM. As an aside, the reader will note that the 7.62x39mm cartridge, unlike the 5.56x45mm and 5.45x39mm cartridges, is an excellent deer and antelope round. Its terminal ballistics are on a par with the old reliable U.S. .30-30 cartridge, which has probably claimed more deer on the North American continent than all other calibers combined.

Izhmash employees and management almost certainly look back to the days when the KS and KSU were manufactured with a degree of nostalgia, as this was the golden age of the Soviet defense industry. The Izhvesk plant typically produced some 500,000 mil-

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(Top) Figure 65. The KS semi-automatic-only rifle (right side), designed to the order of hunters and equipped with a 10-round magazine.
 (Bottom) Figure 66. The KSU short version of a carbine (right side) for professional hunting equipped with a 10-round magazine and with hushstock extended.

tary small arms of all types annually. Defense production actually occupied approximately 80 percent of the overall output of Izhevsk, and the percentage was similar at most other facilities, as well. By the late 1980s, however, the age was coming to an end with the liberalization and democratization of society. The first major blow came in 1988 when the Soviet government announced its decision to cut defense spending by 14 percent and military production by 19.5 percent in both 1989 and 1990. The demise of the Soviet Union and breakup of the Warsaw Pact led to a crisis in small-arms production: military requirements had virtually evaporated, and Izhmash was not prepared for civilian production. It became clear that the company would have to transfer a great deal of its military production potential over to civilian products.

Saiga Civilian Rifles

It was at this point that the KS experience was recalled and work was begun on developing the Saiga civilian rifles for sale in both domestic and international markets.

Saiga-5.6

One product of this effort was the Saiga-5.6 rifle in a new 5.6x39mm caliber. This rifle and cartridge combination was specifically designed for civilian use. The 5.6x39mm cartridge has never been exported.

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5.6x39mm CARTRIDGE SPECIFICATIONS

Type of bullet:	SP or FMJ
Weight of bullet, g. (gr.):	3.5 (54)
Weight of cartridge, g. (gr.):	11.8 (179)
Overall length, mm. (in.):	48.7 (1.91)
Case length, mm. (in.):	39 (1.53)
Muzzle velocity, m./sec. (fps):	915 (3,001)
Muzzle energy, joules (lb.-ft.):	1,396 (1,029)

(Top) Figure 67. From top to bottom the Saiga rifle equipped with a 3-round magazine and stock, and the Saiga with a straight, plastic, nonfolding hushstock.
 (Bottom) Figure 68. The Saiga-S service semiautomatic rifle equipped with a 10-round magazine and a PO-4234 scope, and with the stock extended.



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Figure 69. The Saiga-01 service rifle has an original AK-74 handguard and straight, non-folding plastic stock.

Although they appear virtually identical externally, the AKM and Saiga commercial rifles are quite different internally. In converting the AKM to semiautomatic only, several changes were made to the internal mechanism of the AKM to prevent it from being converted to full automatic. In fact, the trigger mechanism is almost completely different. Even if an AKM sear is inserted into the Saiga trigger mechanism, the rifle will not fire in full automatic because the hammer follows the bolt forward and does not have sufficient energy to drive the firing pin forward to strike the cartridge primer. In addition, the magazine well of the Saiga for Russian sale was changed so that the carbine cannot accept the 30-round AKM magazines. Saiga magazines have a latch plate that is 1mm shorter than that of the AKM, and the Saiga magazine release is lengthened by the same length so AKM magazines will not fit. In addition, the bolt and bolt carrier of the Saiga differ from those of the AKM, and they will not interchange. The cartridge feed has also been modified so that the Saiga magazines must be used, otherwise the cartridge will jam against the breach face and not enter the chamber.

The Saiga carbine was originally chambered only in 7.62x39mm, but in the interest of pursuing international markets, it is now also offered in .222 Remington, .223 Remington (5.56x45mm), and 5.45x39mm.

SAIGA AND SAIGA-S.6 RIFLES SPECIFICATIONS

	Saiga *	Saiga-S.6	Saiga-S.6C
Caliber, mm:		5.6x39	5.6x39
Sighting range:	300 meters all rifles		
Overall length, mm (in.):	1,070 (42.1)	1,070 (42.1)	985 (stock extended) (38.7)
Barrel length, mm (in.):	520 (20.4)	520 (20.4)	745 (folded) (29.3)
Weight, empty w/o magazine, kg. (lbs.):	3.6 (7.9)	3.6 (7.9)	520 (20.4) (3.6 (7.9))
Magazine capacity, rds.	5	10	3.6 (7.9) 10

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Saiga-308

Yet another variation of the basic Kalashnikov design is the Saiga-308 in .308 Winchester (7.62x51mm), which was developed primarily for the international sporting arms market. The rifle also has military potential as a designated marksman rifle issued to the sniper member of the sniper team, and a military version is offered. The lineage of the Saiga-308 is obvious from its appearance, but the rifle is completely different from either the AKM or the previously discussed Saiga carbine.

There are three versions of the Saiga-308. The basic Saiga-308 has a buttstock that is quickly detachable. The Saiga-308-1 has a fixed buttstock, and the Saiga-308-2 has a hardwood skeleton buttstock. All have a flash suppressor designed originally for use on the SVDS folding-stock sniper rifle, although Saiga-308 rifles imported into the United States lack this feature because the U.S. federal bureaucracy has decided that it somehow makes them more deadly. Stocks are furnished in either wood or polymer.

As with the Saiga Carbine, the Saiga-308 cannot be made to fire full automatic. In addition, many modifications have been made to the basic AKM design to accommodate the larger more powerful 7.62x51mm cartridge. The bolt was modified not only to accommodate the larger cartridge, but an extra locking lug was added to deal with the increased forces and pressures. The barrel and barrel block are also heavier to ensure additional

Figure 70. The Saiga-S.65 rifle (right side) with stock folded.

Figure 71. Saiga-308 (right side) with detachable wooden buttstock and stock attached.



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Figure 72. Saiga-308 with detachable wooden buttstock.

strength and accuracy. Of course, all components of the fully automatic trigger mechanism were replaced and the bolt carrier and bolt modified so that they cannot be used with automatic components.

The sights are graduated to 300 meters, and the front sight is adjustable for both windage and elevation. The notch rear sight is adjustable for elevation only. Most rifles are equipped with a PSO-1 telescopic sight mounted on the standard AK quick-detach mount on the left side of the receiver. The Saiga-308 rifles consistently shoot 1.5 minute of angle 10-shot groups at 100 meters, a very respectable performance for any rifle much less a semiautomatic rifle derived from a military assault rifle whose lack of accuracy is well known. The accuracy of the Saiga-308 is attributable to several factors: (1) the heavy cold-hammer-forged heavy barrel; (2) the modified bolt system, which gives more consistent chambering and improved feeding; and (3) the changes to the trigger mechanism, which results in faster lock time.

SAIGA-308 RIFLES SPECIFICATIONS

	Saiga-308	Saiga-308-1	Saiga-308-2
Caliber	.308	.308	.308
Weight, empty	4.1 (9.0)	4.1 (9.0)	4.1 (9.0)
Length, overall, mm (in.):	1,125 (44.3)	1,125 (44.3)	1,165 (41.9)
Length of barrel, mm (in.):	555 (21.8)	555 (21.8)	555 (21.8)
Operation:	Gas operated without gas regulator; locked-breech with rotary bolt; fires from the closed-bolt position		
Barrel:	Chrome-lined, cold-hammered, with four right-handed grooves of one turn in 320mm		
Feed:	Plastic, detachable, box-type, 8-rd. magazine		
Optimal operational range of fire:	300 meters, all variations		

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AK-BASED SAIGA SEMIAUTOMATIC SHOTGUNS

The versatility of the basic Kalashnikov design is exemplified by its conversion not only to the firearms described in the previous pages but into shotguns as well. The reader may well surmise that a shotgun derived from a fully automatic assault rifle would not handle well and have less than optimal pointing capabilities, but this is not the case.

Saiga-12

In tests conducted by the *Guns and Ammo* magazine, the Saiga-12 shotgun proved to handle far better than expected and indeed was found by the test personnel to have natural pointing capabilities. The guns may look like Kalashnikov rifles, but their handling is on a par with the best shotguns! All three versions of the Saiga shotgun come in several varieties to suit the purposes of any user, whether it is for trap and skeet shooting or military and law enforcement use. Although it was not selected, a specially modified version of the Saiga-12 was one of the candidates evaluated for the U.S. Joint Combat Shotgun Program.

Saiga-410

The first gun in the series was the Saiga-410, which most closely resembles the original Kalashnikov rifle both in appearance and function. Like the original rifle, the Saiga-410 has no gas regulator and is capable of firing any 410 shell without adjustment. Stocks are available in either wood or polymer. The

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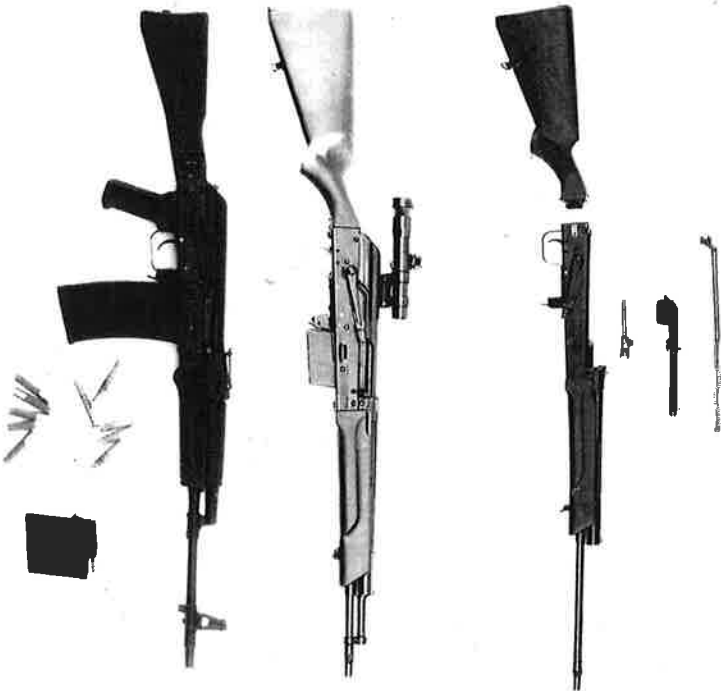
Figure 73. Saiga-410 variations (from top to bottom: Saiga-410 with nonfolding plastic stock; Saiga-410C with folded buttstock; and Saiga-410 with pistol grip.)

standard magazine has a capacity of four shells, while a "special" magazine with 10-round capacity is also provided with the shotgun.

The three versions of the Saiga-410 differ in their operational characteristics. The basic Saiga-410 has a 518mm (20-inch) barrel and a fixed stock. The Saiga-410S has a 570mm (22.4-inch) barrel and a folding stock. The Saiga-410K has a 330mm (13-inch) barrel and also is equipped with a folding stock. The short-barrel length and folding stock of the Saiga-410K make it illegal for importation into the United States.

The Russian versions of the folding-stock guns are automatically inactivated when the stock is folded, a concession to Russian firearms regulations. This only proves that Russian firearms regulations and laws are as capricious and insane as those in the United States—one of the reasons for having a folding stock gun is not only to be able to carry it with the stock folded, but to actually fire it from such a configuration, should the need arise. The deactivation mechanism consists of a button on the left side of the receiver that is depressed when the stock is folded. This inserts a blocking mechanism into the reciprocating parts that inactivates the trigger mechanism and bolt group. Also, the buttstock on the Saiga-410 can be removed and the gun fitted with a pistol grip for tactical operations. The standard barrel of the Saiga-410 is cylinder bore, but it

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(Top) Figure 74. Field-stripped Saiga-410 with detachable buttstock.

(Middle) Figure 75. The Saiga-410K experimental prototype with nonfolding stock.

(Bottom) Figure 76. Saiga-410K-01, the Cossack variation, with a 10-round magazine and original AK handguard and gas chamber.

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can also be provided with improved cylinder bore or with an adjustable choke that is attached to the muzzle of the gun. Sights are a simple button at the front of the gas tube with a typical Kalashnikov notch rear sight adjustable for elevation.

Although the Saiga-410 was originally designed for sporting use, it became clear that it had potential for law enforcement and personal defense use. Since the shotgun is not considered to be as "evil" as a pistol, it is not subject to the stringent regulations attached to pistols in Russia and thus shortened versions are sold for personal defense. The ballistics of the .410 shell are well known, so we will not go into them in any depth here, except to mention that the .410 slug fired from one of these shotguns has terminal ballistics that surpass most handguns, especially those common in Eastern Europe, which generally are 9x18mm Makarov.

COMPARATIVE FEATURES OF .410 SHOTGUN AND HANDGUN AMMUNITION

Type of ammo	Makarov	TT 7	Para	Nagant	.410x2 1/2 (.410x3)
Bullet/slug weight, g.:	9x18	7.62x25	9x19	7.62x39	7.0
Muzzle velocity, m/sec.:	6.1	5.5	8.0	7.0	5.7
Muzzle energy, joules:	315	440	330	290	500
	304	530	432	294	716
					1,099

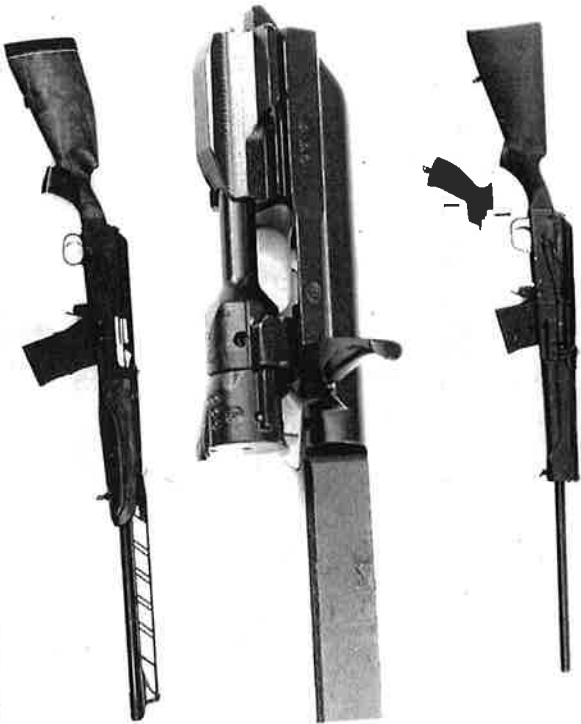
SAIGA-410 SHOTGUNS

	Saiga-410	Saiga-410S	Saiga-410K
Weight, empty and without magazine, kg:	3.4	3.4	3.2
Overall length, with extended stock, mm:	1,107	1,080	840
Length with collapsed stock, mm:	-	835	600
Length of barrel, mm:	518	570	330
Optimal operational range of fire, m.:			
fired with shot	25-35	25-35	25-35
fired with slug	75-100	75-100	75-100
Magazine:			
Plastic, detachable, box-type, 4- or 10-rd. capacity for 70 and 76mm long shells			

Saiga-20

The successful modification of the Kalashnikov design into a 410-gauge shotgun spurred Izhmash designers on to "greater things" and in 1995 they successfully converted the AK into a 20-gauge shotgun, not surprisingly designated the Saiga-20. The Saiga-20 went into series production in 1996 and has been imported into the United States ever since. The Saiga-20 is generally similar to its smaller brother, with a few exceptions. First, the Saiga-20 has a two-position regulator on the gas tube to accommodate 76mm (3-inch) shells. This was necessary on both the Saiga-20 and the Saiga-12 because the 76mm shells raised bolt velocities beyond

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(Top) Figure 77. Saiga-20 with plastic, nonfolding stock and a 3-round magazine. The buttstock can be replaced with a pistol grip.

(Middle) Figure 78. Saiga-20 with detachable wooden buttstock and extended sighting rib. The dovetail front sight is located at the muzzle, which is fitted with the piston is milled out.

(Bottom) Figure 79. Saiga-20 with detachable wooden buttstock and extended sighting rib. The dovetail front sight is located at the muzzle, which is equipped with a flash suppressor.

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(Top) Figure 80, field-stripped Saiga-20S with buttstock extended.
 (Middle) Figure 81, Saiga-20 with a 4-round plastic magazine and a medium-length barrel.
 (Bottom) Figure 82, Saiga-20K (right side) with experimental 10-round magazine.

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SAIGA-20 SPECIFICATIONS

	Saiga-20	Saiga-20SS	Saiga-20K
Weight w/ mag., kg.:	3.2	3.2	3.1
Overall length, with extended stock, mm:	1,135	1,050	910
Length with collapsed stock, mm:	810	670	570
Length of barrel, mm:	570	570	430
Magazine:	Plastic, detachable, box-type, 2-, 5-, or 8-rd. capacity for 70mm and 76mm shells		

Figure 83, Saiga-20K field-stripped.

The most potent member of the Saiga shotgun family is the Saiga-12, which underwent evaluation by the U.S. Army along with several other semiautomatic shotguns as a part of the Joint Combat Shotgun Program. This shotgun grew out of a forecast by the British military planners that the Russian military would require a reliable tactical shotgun in the mid- to late 1990s for special operations use. The venerable Kalashnikov design was of proven reliability, and this, coupled with its worldwide recognition as an intimidating firearm, made it ideal for adaptation as a tactical weapon due to the fact that the mere appearance of the AK in a shotgun would convince some criminals to surrender without a shot being fired.

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(Top) Figure 84. The Saiga-12 auto-loading shotgun with wooden non-folding stock and a modernized receiver. The safety lever of the usual AK type was replaced with a safety knob located in the trigger guard. Attached is an experimental 10-round stamped-steel unit-fired magazine.

(Bottom) Figure 85. Saiga-12S with buttstock extended.

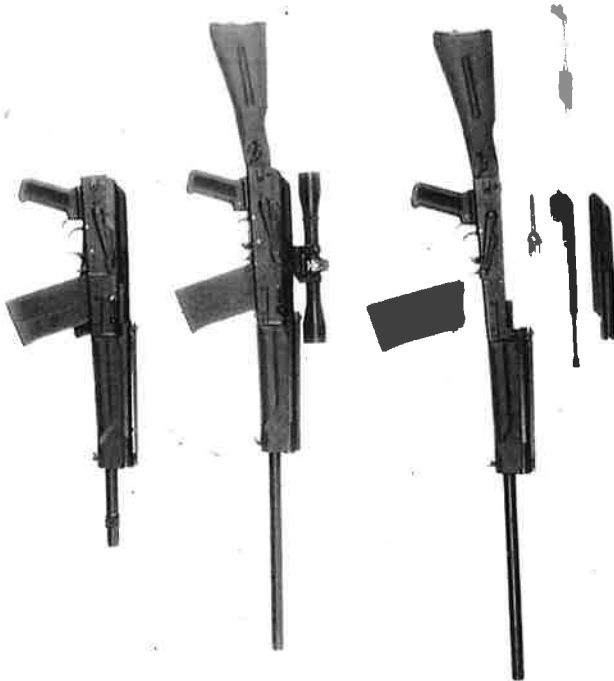
Another militarily significant aspect behind the design of the Saiga-12 was logistics. The shotgun shares approximately 65 percent parts commonality with the AK-100 series rifles, simplifying not only military parts supply but production parts supply as well. From a purely production standpoint, the manufacturing processes necessary to produce the shotgun are nearly identical to those of the rifle, which reduced tooling and setup costs, thereby reducing final costs to the customer.

A final factor in the Saiga-12's design selection was operational. Any soldier or law enforcement officer who has been trained on the AK rifle can operate the Saiga-12 with a minimum of transition training.

A comparison of the Saiga-12 with the other Saiga shotguns reveals a strong family resemblance, as does a comparison with the AK-100 rifles. There is no doubt as to the lineage of the Saiga-12. Although the shotgun receivers appear to be simply scaled up to accommodate the larger 12-gauge shells, this is not the case. The receiver of the Saiga-12 is quite different from the receivers of the smaller shotguns. First, the receiver was enlarged, but as is the case with most such projects, simply enlarging the receiver brought about problems that the Izhmash design team had to overcome.

The design team, headed by Gennady Nikonov (of whom we shall hear a great deal later in this book) first had to relocate the bolt carrier guide rail from the upper portion of the receiver to

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(Top) Figure 86. Saiga-12S field-stripped.

(Bottom) Figure 87. Saiga-12S equipped with PO-4K34 scope and Saiga-12K with buttstock folded (bottom).

the bottom. This minimized the amount of space needed to accommodate the larger bolt carrier, bolt, and barrel extension. Part of the right side of the operating rod was removed to ensure reliability and extraction of the large 12-gauge shell. As would naturally be expected, the ejection port also had to be enlarged. This brought about a potential problem of its own in that it was now so large that dirt and dust might find their way into the operating mechanism of the gun, so yet another modification was undertaken. To prevent the entrance of dust, a sliding ejection port cover was included in the design. This cover rides on the recoil spring-guide rod and functions automatically, opening and closing as the bolt cycles.

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Like the Saiga-20, the Saiga-12 is equipped with a gas regulator to accommodate 76mm (3-inch) shells. The reason is the same as for the Saiga-20: bolt velocities can approach 8 or 10 meters per second with 76mm shells, while the gun is designed for sustained use with ammunition that gives a bolt velocity of 4 meters per second. Again, occasional use of the more powerful ammunition will not harm the gun, but if it is to be used with 76mm ammunition on a regular basis, the gas regulator should be set accordingly.

ACCURACY POTENTIAL OF THE SAIGA-12*

Length of shell	Shot size	Hit probability (full choke)	Hit probability (cylinder)
76 mm	Buckshot	100%	92%
70 mm	AAA	73%	53%
70 mm	1	70%	42%
70 mm	3	69%	42%
70 mm	5	67%	41%
70 mm	6	65%	40%

* Ambient temperature 34°C, side wind velocity 2.5 m/sec; range 35 m.

Magazines for the Saiga-12 are carbon fiber-reinforced polymer and are available with either 5- or 7-round capacity, although magazines of up to 10-round capacity have been developed on an experimental basis. These high capacity magazines are, however, considered to project too far below the receiver to be operationally feasible.

THE RPK AND PK MACHINE GUNS

The RPK Light Machine Gun (Squad Automatic Weapon)

The 7.62x39mm Ruchnoi Pulemet Kalashnikova (RPK) was adopted for service in 1959 as a squad automatic weapon to replace the pre-World War II era Ruchnoi Pulemet Degyarova (RPD). The RPK was based on the AK design for simplified training and logistics, since the manual of arms for the weapon and many of the parts are the same as for the AK-47 or AKM. The basic RPK is still in service as the RPK-74 in 5.45x39mm. Although similar to the AK, there are significant differences between the two weapons. The most obvious difference is that

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Figure 88. The RPK Model 1959 machine gun with drum-type magazine.

the barrel of the RPK is substantially longer (598mm) than that of the AKM (415mm). The RPK barrel is also heavier to allow for the increased rate of fire inherent in a light machine gun. No provision is made for a quick-change barrel. The RPK also has an integral bipod to stabilize the weapon and enhance accuracy in full automatic fire. Magazine capacity was increased from 30 to 45 rounds, and a 75-round drum is available. The shoulder stock of the RPK has been adapted from that of the RPD, and, finally, the rear sight of the RPK is adjustable for both windage and elevation. Prototypes of the RPK were based on the AK-47, but production models are based on the AKM and AK-74, respectively. Like the assault rifles from which they are derived, the RPK and RPK-74 are gas operated and fire from the closed bolt. Folding-stock versions of both the RPK and RPK-74 are available and are designated the RPKS and RPKS-74, respectively. The RPKS-74 has a polymer 45-round magazine, but no drum magazine was ever developed for it. The RPKS and RPKS-74 are intended for use by special operations and airborne forces.

RPK MACHINE GUN, MODEL 1959

Caliber, mm:	7.62x39
Overall length, mm:	1,040
Length of barrel, mm:	590
Sighting radius, mm:	555
Rate of fire, rpm:	600
Magazine capacity, rds:	75
Muzzle velocity, m/sec:	745
Effective range, m:	1,500
Weight, with empty magazine, kg:	5.6

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The PK Unified (General Purpose) Machine Gun

The Pulemet Kalashnikova (PK) machine gun was standardized in 1961 and was one of the world's first post-World War II general purpose machine guns. It replaced the RP-46 and SGM machine guns. Like other weapons in the Kalashnikov family, the PK is based on the AK-47, but the action is inverted, scaled up to accept the more powerful 7.62x54Rmm cartridge and further modified for belt feed. It also fires from the open bolt and features a quick-change barrel. The PK continues in Russian military service today as the PKM. The PKM differs from the original PK in that external barrel grooves have been eliminated, most of the feed mechanism is now made of stamped parts, and the weapon has been lightened by 3 kilograms (6.6 pounds).

A rimmed cartridge like the 7.62x54Rmm is not well-suited for use in a belt-fed machine gun—or in any fully automatic weapon, for that matter—but the Soviet government did not want to complicate its military logistics by adopting a new cartridge. So Kalashnikov was charged with making do with the 1891 vintage 7.62x54R cartridge, although the version now in use by the Russian military is the M11908 version. The rim complicates feeding, but Kalashnikov's design team met the challenge by designing a feed system with a "cartridge ripper" on top of the bolt carrier that first pulls the cartridge out of the nonintegrating feed belt to the rear as the bolt carrier moves in that direction, either manually or under gas pressure. While the bolt carrier is moving to the rear, the cartridge is freed from the cartridge ripper and directed downward into line with the bolt by a spring-loaded depressor (actually a lever) in the feed cover. When the bolt carrier returns forward, the cartridge is thrust into the chamber by the bolt and is fired. As long as the trigger



Figure 89. The PK Model 1961 unified machine gun with bipod.

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is depressed this cycle repeats. The PK feeds from preloaded 25 round nondisintegrating belts that can be linked together for sustained fire.

PK MODEL 1961 UNIFIED MACHINE GUN

Caliber, mm:	7.62x54R
Overall length, mm:	1,173
Length of barrel, mm:	658 (with flash suppressor)
Length of rifled bore, mm:	550
Sighting radius, mm:	663
Rate of fire, rpm:	650
Belt capacity, rds.:	100, 200, and 250
Muzzle velocity, m/sec.:	825
Fighting range, m.:	1,500
Effective range, m.:	3,800
Weight, empty, kg.:	9.0
Weight, g.:	
cartridge	21.8
bullet	9.6
propellant	3.1

Figure 90. The PK Model 1961 machine gun on the Samozhichkov mount.



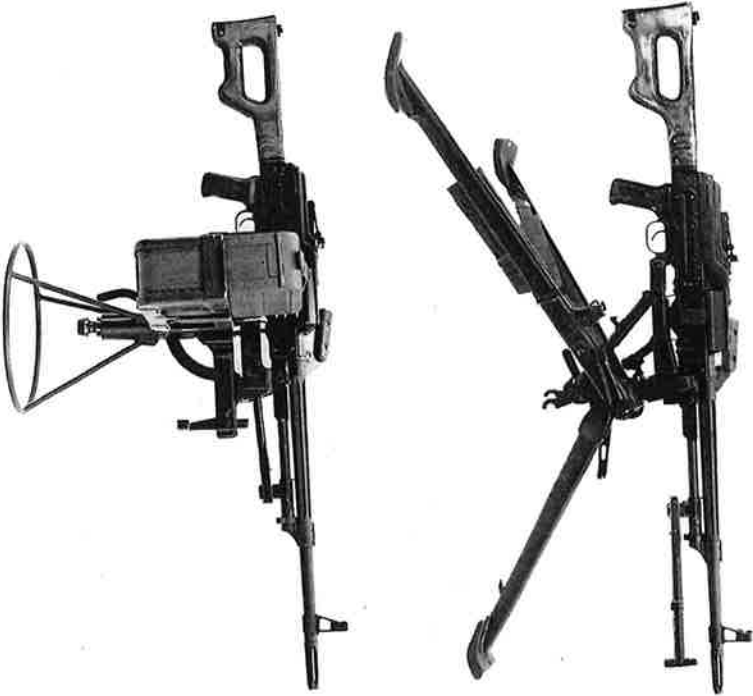
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(Top) Figure 91. The PKS machine gun on the Stepanov mount.

(Bottom) Figure 92. The PKB Model 1962 armored personnel carrier machine gun on the APC mount.

PKS MACHINE GUN SPECIFICATIONS

Weight, with mount, kg: 16.7
 Weight of 250-rd. belt, in container, kg: 9.4



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There are several versions of the PK. In its basic form, it is designated simply PK. In this configuration, the PK can be employed as a light machine gun using its integral bipod. When mounted on a tripod, the PK becomes the PKS (Pulmet Kalashnikova Stankovyy), or machine gun, Kalashnikov.

Mounted. When mounted in a tank, the PK is designated the PKT; when mounted on an armored personnel carrier, it is designated PKB. The basic machine gun remains the same in all cases. Additional components are added to adapt it for its intended role. For example, the PKT has a heavier barrel, optical sight, and remote electric trigger mechanism.

Figure 93. The PKT Model 1962 tank machine gun.

Figure 94. The PKTM Model 1969 modernized tank machine gun (right side).

PKT TANK MACHINE GUN, MODEL 1962

Caliber, mm: 7.62x54R
 Overall length, mm: 1,098
 Length of barrel, mm: 722
 Rate of fire, rpm: 600 to 800
 Muzzle velocity, m./sec.: 855
 Weight empty, kg.: 10.5
 Weight of barrel, kg.: 3.23

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(Top) Figure 95. Experimental light machine gun with combined (alternating) feed from magazine and belt.
 (Bottom) Figure 96. The RPKS-74 Model 1974 light machine gun (right side) with folding buttstock.

EXPERIMENTAL LIGHT MACHINE GUN

Caliber, mm:	5.45x39
Overall length, mm:	1,065
Barrel length, mm:	590
Weight, empty, kg:	6.5
Rate of fire, rpm:	650

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RPKS-74 MODEL 1974 LIGHT MACHINE GUN SPECIFICATIONS

Caliber, mm:	5.45x39
Overall length, mm:	1,060
Length of barrel, mm:	590
Length of rifled bore, mm:	549
Sighting radius, mm:	600
Number of riflings:	4
Cyclic rate of fire, rpm:	600
Operational rate of fire, in bursts, rpm:	150
Magazine capacity, rds.:	45
Effective range, m.:	1,350
Weight, with empty magazine, kg.:	5.15
Weight in firing position, with ammunition, kg.:	5.46

(Top) Figure 97. RPKS-74 field-stripped.
 (Bottom) Figure 98. RPKS-74 experimental prototype.

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(Top) Figure 99, RPK-74 experimental version #1.
 (Bottom) Figure 100, RPK-74 experimental version #2.

**RPK-74 EXPERIMENTAL VERSION #2
 SPECIFICATIONS**

Caliber, mm:	5.45x39
Overall length, mm:	1,065
Length of barrel, mm:	590
Rate of fire, rpm:	600
Magazine capacity, rds:	45
Muzzle velocity, m/sec:	745
Sighting range, m:	1,000
Weight, with empty magazine, kg:	5.2

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**IMPORTANT MILESTONES IN THE HISTORY OF
 THE KALASHNIKOV FAMILY OF WEAPONS**

- 1946 — Creation of the AK-47 (stamped receiver) assault rifle
- 1949 — Beginning of the AK-49 (machined receiver) mass production
- 1959 — Adoption of the RPK light machine gun for service
- 1961 — Adoption of the PK unified machine gun for service
- 1963 — Modernization of AK-47; development of AKM and AKMS
- 1974 — Creation of the AK-74, AKS-74, RPK-74, RPKS-74 weapons
- 1979 — Development of AKS-74U
- 1990 — Creation of the AK-74M
- 1992 — Creation of the AK-100 series of assault rifles
- 1993 — Development of the first AK-based semiauto-only Saiga rifle

LEGENDS AND REALITY OF THE AK

is a history of the world's most successful military rifle and the arms factory that made the Kalashnikov family of weapons. It was co-written by Val Shilin, a close associate of legendary arms designer Mikhail Kalashnikov at the Izhmash Arms Factory, and noted U.S. small-arms expert Charlie Cutshaw, author of *The New World of Russian Small Arms and Ammo*.

The Izhmash Arms Factory (or Izhevsk as it was known before 1941) was founded at the beginning of the 19th century and became Russia's largest and most prestigious firearms producer. Today, it is best known as the home of the Kalashnikov Design Bureau. The genius of Kalashnikov combined with the capabilities of Izhmash formed a union that is rare indeed. As Mikhail Kalashnikov himself said of the relationship, "There wouldn't be a Kalashnikov as an arms designer without Izhmash."

This book chronicles the fruits of that partnership, as well as the weapons of other Izhmash designers (including Evginy Dragunov and his SVD sniper rifle) and those of competing designers. It includes photos and technical specifications of all AK-based weapons, including shotguns, submachine guns, pistols, and civilian rifles; the first public appearance of the AKB and AKB-1 assault rifles; and the mysterious A-62, about which little is known in Russia or the West. Fittingly, the authors have concluded their book with the first published photos of the latest prototypes of the successor to the venerable AK-47, the AN-94 Nikonov, and the real story behind its selection as Russia's combat rifle of the 21st century.

Don't miss this opportunity for a behind-the-scenes look at the history, design, and impact of the Kalashnikov family of weapons through the eyes of a Russian arms designer employed at the factory that made them and an American small-arms expert employed by the U.S. military to evaluate them.

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