= Katyusha rocket launcher =

Katyusha multiple rocket launchers (Russian : ???? ? ?? ; IPA : [k??t?u??]) are a type of rocket artillery first built and fielded by the Soviet Union in World War II . Multiple rocket launchers such as these deliver explosives to a target area more quickly than conventional artillery , but with lower accuracy and requiring a longer time to reload . They are fragile compared to artillery guns , but are inexpensive , easy to produce , and usable on any chassis . Katyushas of World War II , the first self @-@ propelled artillery mass @-@ produced by the Soviet Union , were usually mounted on ordinary trucks . This mobility gave the Katyusha (and other self @-@ propelled artillery) another advantage : being able to deliver a large blow all at once , and then move before being located and attacked with counter @-@ battery fire .

Katyusha weapons of World War II included the BM @-@ 13 launcher , light BM @-@ 8 , and heavy BM @-@ 31 . Today , the nickname is also applied to newer truck @-@ mounted Soviet (and not only Soviet) multiple rocket launchers ? notably the common BM @-@ 21 ? and derivatives .

= = Nickname = =

Initially , concerns for secrecy kept their military designation from being known by the soldiers who operated them . They were called by code names such as Kostikov guns (after the head of the RNII , the Reaction @-@ Engine Scientific Research Institute) , and finally classed as Guards Mortars . The name BM @-@ 13 was only allowed into secret documents in 1942 , and remained classified until after the war .

Because they were marked with the letter K (for Voronezh Komintern Factory) , Red Army troops adopted a nickname from Mikhail Isakovsky 's popular wartime song , " Katyusha " , about a girl longing for her absent beloved , who has gone away on military service . Katyusha is the Russian equivalent of Katie , an endearing diminutive form of the name Katherine : Yekaterina ? Katya ? Katyusha .

German troops coined the nickname Stalin 's organ (German : Stalinorgel) , after Soviet leader Joseph Stalin , prompted by the visual resemblance of the launch array to a church organ and the sound of the weapon 's rocket motors . Weapons of this type are known by the same name in Denmark (Danish : Stalinorgel) , Finland (Finnish : Stalinin urut) , France (French : orgue de Staline) , Norway (Norwegian : Stalinorgel) , the Netherlands and Belgium (Dutch : Stalinorgel) , Hungary (Hungarian : Sztálinorgona) , and in Sweden (Swedish : Stalinorgel) .

The heavy BM @-@ 31 launcher was also referred to as Andryusha (??????? , an affectionate diminutive of " Andrew ") .

= = World War II = =

Katyusha rocket launchers invented in Voronezh , were mounted on many platforms during World War II , including on trucks , artillery tractors , tanks , and armoured trains , as well as on naval and riverine vessels as assault support weapons , Soviet engineers also mounted single Katyusha rockets on lengths of railway track to serve in urban combat .

The design was relatively simple , consisting of racks of parallel rails on which rockets were mounted , with a folding frame to raise the rails to launch position . Each truck had 14 to 48 launchers . The M @-@ 13 rocket of the BM @-@ 13 system was 80 cm (2 ft 7 in) long , 13 @.@ 2 cm (5 @.@ 2 in) in diameter and weighed 42 kg (93 lb) .

The weapon is less accurate than conventional artillery guns , but is extremely effective in saturation bombardment , and was particularly feared by German soldiers . A battery of four BM @-@ 13 launchers could fire a salvo in 7 ? 10 seconds that delivered 4 @.@ 35 tons of high explosives over a 400 @,@ 000 @-@ square @-@ metre (4 @,@ 300 @,@ 000 sq ft) impact zone , making its power roughly equivalent to that of 72 guns . With an efficient crew , the launchers could redeploy to a new location immediately after firing , denying the enemy the opportunity for

counterbattery fire . Katyusha batteries were often massed in very large numbers to create a shock effect on enemy forces . The weapon 's disadvantage was the long time it took to reload a launcher , in contrast to conventional guns which could sustain a continuous low rate of fire .

The distinctive howling sound of the rocket launching terrified the German troops and could be used for psychological warfare .

= = = Development = = =

In June 1938 , the Soviet Jet Propulsion Research Institute (RNII) in Leningrad was authorized by the Main Artillery Directorate (GAU) to develop a multiple rocket launcher for the RS @-@ 132 aircraft rocket (RS for Reaktivnyy Snaryad , ' rocket @-@ powered shell ') . I. Gvay led a design team in Chelyabinsk , Russia , which built several prototype launchers firing the modified 132 mm M @-@ 132 rockets over the sides of ZiS @-@ 5 trucks . These proved unstable , and V.N. Galkovskiy proposed mounting the launch rails longitudinally . In August 1939 , the result was the BM @-@ 13 (BM stands for ?????? M????? (translit . Boyevaya Mashina) , ' combat vehicle ' for M @-@ 13 rockets) .

The first large @-@ scale testing of the rocket launchers took place at the end of 1938 , when 233 rounds of various types were used . A salvo of rockets could completely straddle a target at a range of 5 @,@ 500 metres (3 @.@ 4 mi) . But the artillery branch was not fond of the Katyusha , because it took up to 50 minutes to load and fire 24 rounds , while a conventional howitzer could fire 95 to 150 rounds in the same time . Testing with various rockets was conducted through 1940 , and the BM @-@ 13 @-@ 16 with launch rails for sixteen rockets was authorized for production . Only forty launchers were built before Germany invaded the Soviet Union in June 1941 .

After their success in the first month of the war , mass production was ordered and the development of other models proceeded . The Katyusha was inexpensive and could be manufactured in light industrial installations which did not have the heavy equipment to build conventional artillery gun barrels . By the end of 1942 , 3 @,@ 237 Katyusha launchers of all types had been built , and by the end of the war total production reached about 10 @,@ 000 .

The truck @-@ mounted Katyushas were installed on ZiS @-@ 6 6 × 4 trucks , as well as the two @-@ axle ZiS @-@ 5 and ZiS @-@ 5V . In 1941 , a small number of BM @-@ 13 launchers were mounted on STZ @-@ 5 artillery tractors . A few were also tried on KV tank chassis as the KV @-@ 1K , but this was a needless waste of heavy armour . Starting in 1942 , they were also mounted on various British , Canadian and U.S. Lend @-@ Lease trucks , in which case they were sometimes referred to as BM @-@ 13S . The cross @-@ country performance of the Studebaker US6 2 ½ ton truck was so good that it became the GAU 's standard mounting in 1943 , designated BM @-@ 13N (normalizovanniy , ' standardized ') , and more than 1 @,@ 800 of this model were manufactured by the end of World War II . After World War II , BM @-@ 13s were based on Soviet @-@ built ZiL @-@ 151 trucks .

The 82 mm BM @-@ 8 was approved in August 1941 , and deployed as the BM @-@ 8 @-@ 36 on truck beds and BM @-@ 8 @-@ 24 on T @-@ 40 and T @-@ 60 light tank chassis . Later these were also installed on GAZ @-@ 67 jeeps as the BM @-@ 8 @-@ 8 , and on the larger Studebaker trucks as the BM @-@ 8 @-@ 48 . In 1942 , the team of scientists Leonid Shvarts , Moisei Komissarchik and engineer Yakov Shor received the Stalin prize for the development of the BM @-@ 8 @-@ 48 .

Based on the M @-@ 13 , the M @-@ 30 rocket was developed in 1942 . Its bulbous warhead required it to be fired from a grounded frame , called the M @-@ 30 (single frame , four round ; later double frame , 8 round) , instead of a launch rail mounted on a truck . In 1944 it became the basis for the BM @-@ 31 @-@ 12 truck @-@ mounted launcher .

A battery of BM @-@ 13 @-@ 16 launchers included four firing vehicles , two reload trucks and two technical support trucks , with each firing vehicle having a crew of six . Reloading was executed in 3 ? 4 minutes , although the standard procedure was to switch to a new position some 10 km away due to the ease with which the battery could be identified by the enemy . Three batteries were combined into a division (company) , and three divisions into a separate mine @-@ firing regiment

of rocket artillery .

= = = Variants = = =

Soviet World War II missile systems were named according standard templates which are the following :
BM @-@ x @-@ y (names used for ground vehicles)
M @-@ x @-@ y (names used for towed trailers and sledges)
y @-@ M @-@ x (names used for navy)
where :
x is a model of a missile .
y is a number of launch rails / tubes .
In particular , BM @-@ 8 @-@ 16 is a vehicle which fires M @-@ 8 missiles and has 16 rails . BM @-@ 31 @-@ 12 is a vehicle which fires M @-@ 31 missiles and has 12 launch tubes . Short names such as BM @-@ 8 or BM @-@ 13 were used too . Number of launch rails / tubes is absent here . Such names describe launchers only no matter a vehicle they are mounted on . In particular BM @-@ 8 @-@ 24 had a number of variants : vehicle mounted (ZiS @-@ 5 truck) , tank mounted (T @-@ 40) and tractor mounted (STZ @-@ 3) . All of them had the same name : BM @-@ 8 @-@ 24 . Other launchers had a number of variants mounted on different vehicles too . Typical set of vehicles for soviet missile systems is the following :
ZIS @-@ 5 (truck) ,
ZIS @-@ 6 (truck) ,
GAZ @-@ AA (truck) ,
STZ @-@ 3 (tractor) ,
T @-@ 40 (tank) ,
Studebaker US6 (truck) ,
Armored train car ,
River boat ,
Towed sledge ,
Towed trailer ,
Backpack (portable variant , so called " mountain Katyusha ") ,
ZiS @-@ 151 (truck , used after the war) ;
Note : There was also an experimental KV @-@ 1K ? Katyusha mounted on KV @-@ 1 tank which was not taken in service .
A list of some implementations of the Katyusha follows :

= = = Rocket variants = = =

Rockets used in the above implementations were :
The M @-@ 8 and M @-@ 13 rocket could also be fitted with smoke warheads , although this was not common .

= = = Combat history = = =

The multiple rocket launchers were top secret in the beginning of World War II . A special unit of the NKVD troops was raised to operate them . On July 14 , 1941 , an experimental artillery battery of seven launchers was first used in battle at Rudnya in Smolensk Province of Russia , under the command of Captain Ivan Flyorov , destroying a concentration of German troops with tanks , armored vehicles and trucks at the marketplace , causing massive German Army casualties and its retreat from the town in panic . Following the success , the Red Army organized new Guards mortar batteries for the support of infantry divisions . A battery 's complement was standardized at four launchers . They remained under NKVD control until German Nebelwerfer rocket launchers became common later in the war .

On August 8 , 1941 , Stalin ordered the formation of eight special Guards mortar regiments under the direct control of the General Headquarters Reserve (Stavka @-@ VGK) . Each regiment comprised three battalions of three batteries , totalling 36 BM @-@ 13 or BM @-@ 8 launchers . Independent Guards mortar battalions were also formed , comprising 12 launchers in three batteries of four . By the end of 1941 , there were eight regiments , 35 independent battalions , and two independent batteries in service , fielding a total of 554 launchers .

In June 1942 heavy Guards mortar battalions were formed around the new M @-@ 30 static rocket launch frames , consisting of 96 launchers in three batteries . In July , a battalion of BM @-@ 13s was added to the establishment of a tank corps . In 1944 , the BM @-@ 31 was used in motorized heavy Guards mortar battalions of 48 launchers . In 1943 , Guards mortar brigades , and later divisions , were formed equipped with static launchers .

By the end of 1942 , 57 regiments were in service ? together with the smaller independent battalions , this was the equivalent of 216 batteries : 21 % BM @-@ 8 light launchers , 56 % BM @-@ 13 , and 23 % M @-@ 30 heavy launchers . By the end of the war , the equivalent of 518 batteries were in service .

= = Post @-@ war development = =

The success and economy of multiple rocket launchers (MRL) have led them to continue to be developed . During the Cold War , the Soviet Union fielded several models of Katyusha @-@ like MRL , notably the BM @-@ 21 launchers somewhat inspired by the earlier weapon , and the larger BM @-@ 27 . Advances in artillery munitions have been applied to some Katyusha @-@ type multiple launch rocket systems , including bomblet submunitions , remotely deployed land mines , and chemical warheads .

With the breakup of the Soviet Union , Russia inherited most of its military arsenal including its large complement of MRLs . In recent history , they have been used by Russian forces during the First and Second Chechen Wars and by Armenian and Azerbaijani forces during the Nagorno @-@ Karabakh War . Georgian government forces are reported to have used BM @-@ 21 or similar rocket artillery in fighting in the 2008 South Ossetia war .

Katyusha @-@ like launchers were exported to Afghanistan , Angola , Czechoslovakia , Egypt , East Germany , Hungary , Iran , Iraq , Mongolia , North Korea , Poland , Syria , and Vietnam . They were also built in Czechoslovakia , the People 's Republic of China , North Korea , and Iran .

Proper Katyushas (BM @-@ 13s) also saw action in the Korean War , used by the Chinese People 's Volunteer Army against the South and United Nations forces . Soviet BM @-@ 13s were known to have been imported to China before the Sino @-@ Soviet split and were operational in the People 's Liberation Army .

Israel captured BM @-@ 24 MRLs during the Six @-@ Day War (1967) , used them in two battalions during the Yom Kippur War (1973) and the 1982 Lebanon War , and later developed the MAR @-@ 240 launcher for the same rockets , based on a Sherman tank chassis .

During the 2006 Lebanon War , Hezbollah fired between 3 @,@ 970 and 4 @,@ 228 rockets , from light truck @-@ mounts and single @-@ rail man @-@ portable launchers . About 95 % of these were 122 mm (4 @.@ 8 in) Syrian @-@ manufactured M @-@ 21OF type artillery rockets which carried warheads up to 30 kg (66 lb) and had a range of 20 km , perhaps up to 30 km (19 mi) . Hamas has launched 122 @-@ mm Grad @-@ type Katyusha rockets from the Gaza Strip against several cities in Israel , although they are not reported to have truck @-@ mounted launchers . Although Katyusha originally referred to the mobile launcher , today the rockets are often referred to as Katyushas .

Some allege that the CIA bought Katyushas from the Egyptian military and supplied them to the Mujahideen (via Pakistan 's ISI) during the Soviet Afghan war .

Katyusha @-@ like MRLs were also allegedly used by the Rwandan Patriotic Front during its 1990 invasion of Rwanda , through the 1994 genocide . They were effective in battle , but translated into much anti @-@ Tutsi sentiment in the local media .

It was reported that BM @-@ 21 launchers were used against American forces during the 2003

invasion of Iraq . They have also been used in the Afghanistan and Iraq insurgencies . In Iraq , according to Associated Press and Agence France @-@ Presse reports , Katyusha @-@ like rockets were fired at the Green Zone late March 2008 .

Katyusha rockets were reportedly used by both Gaddafi Loyalists and anti @-@ Gaddafi forces during the Libyan Civil War .

Also , several countries have continued to build and operate Katyusha @-@ like systems well into the 21st century , as for example the Teruel MRL of the Spanish Army .

In February 2013 , the Defense Ministry of Yemen reported seizing an Iranian ship , and that the ship 's cargo included (among its other weapons) Katyusha rockets .

In August 2013 the Irish republican dissident group Óglaigh na hÉireann was blamed for planting a Katyusha @-@ style rocket in undergrowth next to a field near Cullyhanna in South Armagh in an area used by soldiers on training exercises . The weapon was to be triggered using a mobile phone .

The Russian army has mounted some multiple rocket launchers on turretless T @-@ 72 tanks and called the weapon a TOS @-@ 1 . These were developed in the 1980s , but have been modernized and are in very limited service .