

One of the most curious military vehicles used by the Red Army was 'aerosani' or aerosans, propeller-driven aerosleds. These strange-looking but highly effective vehicles were used in various conflicts during the winters including World War Two as reconnaissance, transport, medical evacuation and raider vehicles.

Their history long pre-dated World War Two, however, as aerosans were used by Russian forces during World War One, the civil war that followed the 1917 Russian Revolution, and by the Red Army during the Russo-Finnish 'Winter War' of 1939-40. Aerosans proved particularly effective in the snowbound northern climate of the Soviet Union, where wheeled and often tracked vehicles were frequently road-bound by heavy snowfalls. Though generally considered as a specifically Russian/Soviet vehicle type, aerosans were also developed concurrently in small numbers by other nations including Austria, France, Finland and Germany.

The word aerosani is derived from the Russian word 'sani' meaning sledges, with the Russian grammar being as curious as the vehicles themselves, in that there is no singular form of either word, 'aerosleds' always being plural.

The first Russian aerosans were developed as winter transport in Tsarist Russia at the beginning of the 20th Century. One of the first practical aerosan designs was developed in the winter of 1904-05 and the first production of aerosans began at the Moscow 'DUKS' plant in 1907. Meantime in Ukraine, a young engineer at the Kiev Polytechnical Institute by the name of Igor I Sikorsky was also working on aerosan concepts, long before he turned to designing helicopters.

Russian military aerosans had their combat debut during World War One during the winter of 1914-15. They were used for front line communication, reconnaissance and transport roles, for the reliable all-weather delivery of rations and ammunition to frontal areas, and for the evacuation of wounded. Experience with aerosans during the war and the early months of the Civil War that followed demonstrated their usefulness for winter military applications.

Two Soviet scientific research institutes (NII) had been organised in November 1918; one (NAMI) concentrated on vehicle development, the other (TsAGI) on aircraft development, with aerosans being designed by both. In 1919 aerosan



The commander of an NKL-16 M-1941 transport aerosan leaning out of his aerosan, near Staraya Russa. The strapped-on fuel tank is the primary distinguishing feature of the NKL-16 M-1941. Note also the red and white warning marking on the propeller guard and the spare propeller wrapped in canvas and strapped to the vehicle side. STEVE ZALOGA

A patrol of NKL-16 M-1941 transport aerosans. A wooden frame has been bolted over the fuel tank of the lead aerosan, the purpose of which is unclear. Note the spare propeller strapped to the vehicle side

Winter Transport

The strange-looking Russian aerosleds were used to great effect in various conflicts



development was further formalised when the 'Committee for Aerosan Production' (better known by its Russian acronym KOMPAS) was established at the TsAGI aircraft institute.

In 1931, the KOMPAS organisation was replaced by a new structure responsible for military aerosan development and construction, best known by the acronym OSGA. In 1934, OSGA was provided with its own assembly workshop, Plant N°41 within the command structure of the Ministry of Forestry Production (NarKomLes

- NKL) hence the 'NKL' designation of later production aerosans.

Several OSGA and NKL aerosan designs developed in the 1930s had their combat debut during the 1939-40 Russo-Finnish 'Winter-War'. They were used in significant numbers for communication, for delivering ammunition, fuel and supplies to the front across frozen lakes in snowbound regions, serving within independent patrols and desant groups, and evacuating wounded on the return journey. They proved particularly effective in Finland, with its many frozen

lakes and rivers and deep winter snow.

At the outset of World War Two all available aerosans, whether military or civilian, were repaired and mobilised for use by the Red Army, and a special command structure was set up in the tank and armoured forces directorate (GABTU) to direct the operation of transport and raider aerosans. Work also urgently began on the development of new military aerosan designs - the RF-8-GAZ-98 reconnaissance, NKL-16 M-1941 transport-desant, and the armed and armoured NKL-26 and NKL-32 raider types.

Soviet defence authorities ordered NarKomLes, NarKomFlot and NarKomRibProm (the ministries of wood, sea fleet and fishing respectively) to build 4,000 aerosans of two main types in 1941 – a new model of the NKL-16 for command, transport and medical evacuation, and the NKL-26 raider aerosan. Further instructions were given to develop new combat and transport aerosans for military service.

The NKL-26 and NKL-32 combat aerosans were both provided with 8mm steel armour plating on the glacis, but to be armed respectively with a 7.62mm DT light and a 12.7mm DShK heavy machine gun. All aerosans were to be powered by M-11 engines removed from aircraft service having exceeded their flight hours and providing an operational speed of 30 to 50km/h and a minimum range – which was defined in



A fully restored NKL-26 aerosan at the Museum of National Military History, Padikovo, Moscow region

SPECIFICATIONS

- Combat weight** 1,254kg
- Armament** 7.62mm DT / 3,000 rounds
- Armour** 8mm
- Length** 5.50m
- Width** 2.60m
- Height** 3.19m
- Base** 3m
- Track** 1.65m
- Skis** 2.7m x 0.325m
- Engine** M-11G, 5-cylinder aviation engine, **developing** 110bhp at 1500rpm
- Propeller** 2.40m wooden propeller
- Maximum speed** 70-75km/h
- Crew** Two

An original drawing of the NKL-26 aerosan



NKL-26 raider aerosans on patrol, April 1942. STEVEN J. ZALOGA

aviation rather than vehicular terminology – at five running-hours.

NKL-26 M-1941 Combat Aerosan

The armoured NKL-26 (НКЛ-26) raider aerosan was developed in the late summer of 1941 as a collaborative effort between engineers at OKB N°41 in Moscow and GAZ in Gorky. The NKL-26 Model 1941 had a crew of two, a commander (who also functioned as the gunner) and a driver-mechanic. The NKL-26 had a wooden plywood cabin built on a wooden framework, but differed from transport models primarily in having an 8mm armoured steel glacis sloped at 60°, with a small vision hatch for the driver, and a roof-mounted 7.62mm DT machine gun located in an open tourelle ring mount on the hull roof, with an armoured shield to protect the gunner, with a 3,000 round ammunition complement. The traverse was mechanically limited to 300° to prevent damage to the rear-mounted propeller.

Access was via a single door next to the driver on the left side of the vehicle. Two small windows were in the front of the cabin for peripheral vision. The NKL-26's running gear consisted of four identical skis of inverted 'T' section construction, mounted on coil-spring suspension located to the hull at the front and the engine-mounting framework at the rear. The skis were constructed of 10mm thick pine and were set wider at the front than the rear to aid steering in deep snow, with steel or duraluminium channels being fitted to the undersides of the skis to provide directional stability and prevent damage. All skis were steerable via a mechanical pantograph system connected to a conventional steering wheel in the cab.

The NKL-26 was powered by a rear-mounted five-cylinder M-11G five-cylinder air-cooled radial aircraft engine developing 110hp, with electric start, driving a twin bladed wooden propeller, as used on the NKL-16 Model 1941 transport aerosan. The propeller used on the NKL-26, and all NKL aerosans, was mounted to the hub by lock bolts. A tubular steel framework was located around the propeller to protect it from damage, painted with red and white stripes. The main oil reservoir and its cylindrical housing were located at the front of the engine, with the oil tank being removable to

allow for off-vehicle pre-heating before cold starting when ambient temperatures were below -20°C. The fuel tank was located on the floor at the rear of the wooden hull. A single driving light was located on the left side of the vehicle. The NKL-26 could travel at 70km/h on 'roads' and smooth snow, and at 35km/h across uneven snow. They were, however, unable to stop suddenly and vulnerable to hitting tree branches and bushes, with frequent accidents resulting in propeller damage.

The original NKL-26 prototype was completed in September 1941, followed immediately by proving trials, for which purpose (as it was late summer) the prototype was mounted on wheels. The trial, which covered 150km on roads, 350km on dirt roads and 500km across other terrains, was considered a success; however, a second test was recommended on snow in the coming winter, by which time the NKL-26 was already in series production, which continued until May 1942.

According to plant records, approximately 400 workers were involved in aerosan production at Plant N°41 in Kirov, but due to a lack of key personnel, many unqualified workers and even older children were employed in assembly.

NKL-32

The NKL-32 was a variant of the NKL-26 armed with a roof-mounted 12.7mm DShK heavy machine gun rather than the standard 7.62mm DT weapon. Orders specified that 500 NKL-32s were to be built, but there is little evidence to suggest that more than a handful of NKL aerosans were so armed. The definition of what exactly constituted an NKL-32 versus an NKL-26 also differed within GKO documents, with some referring to the armoring of the glacis and the internal fuel tank rather than the armament. The definition of what constituted an NKL-32 would appear to have ultimately settled on armour rather than armament improvements. The NKL-32 was never differentiated in service, with all raider aerosans being designated NKL-26.

NKL-26 M-1942

An updated design of the NKL-26 combat aerosan was developed in 1942 but did not enter production. Two prototypes were



An NKL-26 M-1942 fitted with the 82mm RS-82 rocket launcher tourelle under evaluation at Kubinka in July-August 1942. The RS-82 aircraft rocket was the predecessor to the BM-8 'Katyusha' rocket launcher system. TSAMO

'All aerosans were to be powered by M-11 engines removed from aircraft service'



The NKL-26 driver-mechanic controlled the vehicle by means of a conventional steering wheel linked to the front skis



The original production model NKL-26 was modified in 1942 as the NKL-26 M-1942, the prototype of which was tested in several variants in the summer of 1942. TSAMO



One prototype NKL-26 M-1942 was fitted with a tourelle mounted RS-82 rocket launcher system. The system proved to have had limited firing accuracy with the simple circle aiming sights provided on the prototype. It was also highly dangerous for the operator. TSAMO



The original NKL-16 M-1942 transport aerosan undergoing trials. Again, note the spare propeller strapped to the side of the vehicle. Aerosans were adept at circumnavigating roads held by enemy forces.

The original NKL-16 M-1942 transport aerosan undergoing acceptance trials at Kubinka in July-August 1942. As the tests were conducted in the summer the vehicle was for obvious reasons mounted on pneumatic tyres for testing. TSAMO



'Aerosans continued to be used in small numbers by the Red Army until the end of the war'

built in Gorky and shipped to Kubinka where they were tested in the autumn of 1942. There were minor changes to the structure and dimensions, but the principal change was to the armament options. Three variants of the new NKL-26 -1942 were tested at Kubinka, one with a tourelle-mounted 7.62mm DT machine gun, the second variant armed with twin co-axial 50mm mortars and a 7.62mm DT machine gun, and the third armed with an 82mm RS-82 rocket launcher. The third variant was probably a rebuild of one of the other two original chassis. The trials provided mixed results and the decision was taken not to produce the new version when the existing NKL-26 M-1941 had proven entirely adequate for its intended role.

NKL-26 Aerosans in Combat

In the late autumn of 1941, aerosans were formed into combat (BASB) and transport (TASB) aerosan battalions, both types comprising three companies, with approximately 45 vehicles in each battalion. The newly formed battalions began to be equipped with aerosans from late December 1941 and were despatched to the front in January/February 1942. NKL-26s were usually formed into combat battalions for reconnaissance, guarding the flanks of tank forces, support of ski-patrols, patrolling lakes, guardian airfields, delivering supplies and ammunition and protecting command points.

Records show that by January 25, 1942, 13 aerosan battalions, totalling 546 aerosans, had been despatched to the front. A total of 70 aerosan battalions were formed between 1941 and 1943, with the last aerosan battalion being formed in June 1943 for operations the following winter.

During World War Two, aerosans including the NKL-26 were used in considerable numbers, especially during the winter of 1941-1942, which had the unusual combination of both heavier snowfalls and colder than usual temperatures. In these conditions, aerosans proved highly effective in forward areas inaccessible to other vehicles. Aerosans including the NKL-26 were used during the defence of Moscow, and later in Red Army-held regions around Leningrad and the Karelian Isthmus. The NKL-26 was used during the Siege of Leningrad for moving cargo across Lake

Ladoga, re-supplying the city across the frozen 'road of life' during the winter months of the siege.

Several documented episodes describe the use of aerosans to re-supply personnel, ammunition and rations to isolated Red Army units in the front line, particularly in the regions of Volokolamsk and Klin and around Leningrad, Pskov and Novgorod in the winter of 1941-42.

Aerosans were adept at circumnavigating roads held by enemy forces. When employed in raiding operations, aerosans would appear where least expected, often far behind enemy front lines, rapidly deploying ski desant forces and their light support equipment. Up to 20 infantry on skis could be towed by a single NKL-26 aerosan.

Transport and combat aerosans were again used for ammunition re-supply and medical evacuation in the winter of 1942-43, including during the Battle of Stalingrad, where aerosan battalions delivered ammunition and rations to isolated Red Army units. On the North-Western Front near Leningrad, the 11th, 18th and 35th TASB over three days in February 1943 moved 22 45mm anti-tank guns (on sleds), 10 heavy machine guns, 18 mortars, 220 boxes of grenades, 100 boxes of small arms ammunition, 900 crates of artillery shells and 535 infantry to forward areas, while evacuating 840 wounded on the return journeys.

After their peak deployment in the winters of 1941-42 and 1942-43, aerosans continued to be used in small numbers by the Red Army until the end of the war. Official GBTU (now the Main Tank Directorate) records show that on January 1, 1944, the Red Army still had 3,330 NKL aerosans in service. The use of Soviet-built aerosans was not confined to the Red Army. During the winter campaign of 1941-42, many were captured and entered service with the German Wehrmacht. On the Finnish Front, aerosans were used by the Red Army and by Finnish forces. The latter captured and put into service Soviet origin aerosans in addition to using its own designs. A small number of aerosans, including the NKL-26, were used by the Soviet Army and border guards into the mid-1950s, with many others converted to use delivering post in the winter in areas of Siberia with large frozen rivers. ◀



An NKL-26 raiding patrol, west of Novgorod, February 1944. STEVEN J. ZALOGA