

Numbered Soviet Aviation Factories, 1921–1941

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World War 1 accelerated the growth of the Russian aviation industry which, towards the end of 1917 employed 10-12,000 people in 27 factories of which, 14 manufactured aircraft, 7 aeroengines, 3 propellers and skis, 2 electrical engine components and 1 aviation instruments. Sources differ from a minimum total of 21 to a maximum of 29 aviation factories but the figures quoted above seem sensible. All these facilities were privately owned. In addition, seven more plants were being built. However aircraft technology had not kept pace with the rest of Europe; all engines and 70% of airframes were still based on foreign designs. In spite of the civil unrest which erupted in 1917 1,099 aircraft and 374 engines were built. The Revolution and Civil War reduced these numbers in 1918 to 225 and 79 respectively and the upheavals wrought by the continuation of the Civil War ensured that only 668 new aircraft and 264 aeroengines were produced during that time; it is understandable that throughout this troubled period aircraft could not be given high priority.

Nationalisation of the aircraft industry began slowly in January 1918 and continued until the end of the year at the earliest. In June 1918 Lenin signed a decree to extend the nationalisation to cover all means of production; a lengthy process and one fraught with many problems. A commission was established on 1 August 1918 to reorganise the aviation industry; it was part of the 'Sektziya aviatsii i vozdukhoplavaniya' (Section for Aviation and Aeronautics) of Otdelenie voennoi promyshlennosti (Department of the Defence Industry) itself from the Otdel metalla (metal section) of VSNKh (Vyshii Sovet Narodnogo Khozyaistva- Supreme Council of the People's Economy). On 31 December 1918 Glavkoavia (Glavnoe pravlenie ob"edinyonnykh aviatsionnykh zavodov – Main Directorate for the Amalgamated Aircraft Factories) was formed and placed in direct control of the nationalised aviation factories of which, at that time, there were only four: Moska, Duks, Motor and Gnom-Ron. Unfortunately, Glavkoavia was shuttled backwards and forwards between VSNKh and Chusosnabarm (Chrezvychainyi upolnomochennyi Sovet Rabochekrest' yanskoi oborony Krasnoi Armii i Flota – Extraordinary Supreme Council of the Workers' and Peasants' Defence for Supplying the Red Army and Navy) ie between civil and military control, albeit with an intervening layer of management.

At first Glavkoavia was directed by Glavmetall (Glavnoe upravlenie metallicheskoii promyshlennosti – Main Directorate for the Metal Industry) but from 22 December 1919 by Promvoensovet (Military Council for Industry) under Chusosnabarm. By that time it controlled ten plants: the six additional ones were Gamayun, Lebedev at Moscow and Penza, Russko-Baltiiskii vagon zavod (RBVZ), Salmson and Aerotekhnicheskii. The Gamayun (a mythical bird in Russian folklore) was another name for the Shchetinin factory which was subsequently closed and its equipment and personnel incorporated into what was the Russko-Baltiiskii vagon zavod and which reopened from June 1920 as the Petrogradskii ob"edinennyi aviatsionnyi zavod (Petrograd Combined Aviation Factory). Two other plants were also cannibalised to provide equipment: the Lebedev factory in Petrograd and the Slesarenko facility.

One advantage of military rule was that on 16 June 1920 a resolution of the STO (Sovet Truda i Oborony – Council for Labour and Defence) gave Glavkoavia the same high priority as other crucial defence industries for raw materials, components and fuel, in addition to extra food as an incentive bonus for workers. By the end of the Civil War in 1921 the rejuvenation of an aviation industry, which had been almost completely destroyed, began in earnest. On 17 March 1921 Glavkoavia was returned to civilian control by transforming it into the 5th GU (Glavnoe Upravlenie) of the Defence Industry under VSNKh and on 22 March 1921 the decision was taken to designate plants for either pilot or series production and this was confirmed by Promvoensovet on 15 July 1921. Further government support was confirmed when a special programme was accepted.

About this time aviation plants, which had previously used their pre-Revolutionary names, were given numbers as Gosudarstvennoe Aviatsionnoe Zavody (GAZ). It is most likely that this was done for administrative convenience rather than for security reasons but it also had the advantage of emphasising the new ownership.

GAZ No.	Location	Product	Former Name	Details	Zavod No.
1	Moscow, Yamskoe pole	aircraft	Duks	numbered 11/18, renamed 'im. ODVF' in 1923 and 'im. Aviakhima' in 1925; new shops built 1924	1
2	Moscow, Semenovskaya	aeroengines	Gnom-Ron	numbered in 1918; became opytnyi zavod 9/22 to develop Soviet version of Liberty engine renamed 'Ikar' 1922; merged with GAZ-4 21/3/27 to become zavod 24 im. M.V.Frunze	24
3	Petrograd, from 1924 Leningrad	Aircraft	Russko-Baltiiskii vagonzavod (RBVZ)	Started in 1912 as the aviation section of the 'Russko-Baltiiskii zavod' but became GAZ-3 in 1920 and named 'Petrogradskii ob"edinennyi aviatsionnyi zavod' 6/20 on absorbing 'Lebedev' and 'Gamayun' zavody; later absorbed zavody 'Slesarenko' and 'Integral'; renamed 'Krasnyi Letchik' 1922	23
4	Moscow, first Danilovskaya zastava then from 1923 Semenovskaya	Aeroengines	Motor	numbered in 1918 and in 1923 absorbed GAZ-6 'Amstro' on transferring from Danilovskaya zastava to Semenovskaya; merged with GAZ-2 21/3/27 to become zavod 24 im. M.V.Frunze	24
5	Moscow	Aircraft	Moska later Samolet	Became GAZ-5 in 1923; renumbered zavod 25 in 1927 but absorbed by zavod 39 in 9/30 and site later used for the consumer goods section of zavod 1	25
6 (1)	Moscow, Semenovskaya	Aeroengines	Amstro	former 'Sal'mson' renamed Amstro; absorbed by GAZ-4 in 1923	
6 (2)	Rybinsk	Aeroengines		under construction as 'Russkii Reno' but became GAZ-3 (automobiles) later converting to aeroengines as GAZ-6 (aircraft) in 1923	26
7 (1)	Penza	Aircraft	Lebedeva zavod	Renamed 'Konek-Gorbunok' but closed 1924	
7 (2)	Moscow, Fili	Aircraft	Avto Russko-Baltiiskii vagonzavod	'Russko-Baltiiskii zavod' evacuated from Riga to Fili 4/16 but became first GAZ-2 (automobiles) in 1917 and 1st BTAZ (bronetankovyi zavod) at end of 1918 (or 8/21?);	22

				Junkers aircraft plant 1923 absorbing some equipment from zavod 5 c.1926; redesignated z-d 22 im. X-letiya Oktyabrya in 1927	
8	Moscow, Presnya	Components	Propeller	propellers and skis; in 1923 absorbed the Mure and Merelize furniture plant; renamed 'Aerotekhnicheskii' but designated zavod 28 in 1927 and named im. Ordzhonikidze in 1928	28
9	Aleksandrovsk later Zaporozh'e	Aeroengines	Deka	became 'Bol'shevik' in 1922 and zavod 29 in 1927	29
10	Taganrog	Aircraft	Lebed	opened 8/20 and redesignated zavod 31 in 1927	31
11(1)	Odessa	Aircraft	Slesarenko	some sources say named 'Anatra zavod'; closed 5/12/22 (or 21/5/24), equipment sent to GAZ-3 and site became a repair plant, GAM-7, of Remvozdukh (Aeronautical Repairs)	
11 (2)	Moscow	Components		'Aviasnabbaza' opened 1924 as 'Lesopil' nui (sawmill) for GAZ-8; redesignated zavod 41 1/10/27	41
12 (1)	Kiev	Aircraft		opened as GAZ-12 1920; closed 1924 and became repair plant of Remvozdukh; 1930 redesignated zavod 43 for prototype construction	43
12 (2)	Moscow	Aeroengine components	Radio	designated GAZ-12 in 9/26 (or 17/11/26) on transfer to Aviatrest	32
13	Omsk	Aircraft		some sources suggest this was a VVS aircraft repair plant; others that the number 13 was not used in the GAZ list, the latter is more likely	
14	Sarapul'	Aircraft		formed in IM division (DVK) mid-1920; closed 1924; number 14 not used again in GAZ list	
15	Simferopol'	Aircraft	Anatra	became zavod 15 in 1921 but closed 1923 and site used by leather processing plant; number not used again in GAZ list	
16	Moscow	Paints and lacquers	Kokha	renamed 'Aerolak' in 1922; became zavod 36 in 1927	36

The closure or transfer of some aviation plants as shown in the table above may appear curious in an expanding industry but the actions were justified by the fact that they were very small and therefore not considered viable under Lenin's New Economic Policy. As the defence industry, including that of

aviation, rapidly grew the government looked for better organisation structures and on 28 January 1925 Glavkoavia was replaced by Aviatrest which was given a much greater degree of autonomy. Aviatrest, now effectively an independent industrial sector, was subordinated to Glavmetall and made commercially accountable. It was allowed to buy property, lease buildings and open offices and branches etc. On 1 February 1925 Aviatrest controlled eleven plants and by the end of that year also had jurisdiction over the engine shop at the 'Bol'shevik' works, Leningrad. A development plan for the aviation industry was approved on 17 November 1926 by which the annual production capacity for airframes was to reach 1500 by 1 October 1929 and for aeroengines 1820 by 1 October 1931.

Although Glavkoavia was abolished and replaced by Aviatrest, the GAZ numbering system of aviation factories was in use until 1927. At that time fear of Western intervention led to an enhanced armaments programme and the formation of 'cadre defence plants'. Although these plants were specialists in military products, it was recognised that they could not fulfil all orders required on mobilisation and plans were therefore made to enable factories producing civil goods, assisted by the cadre plants, to be rapidly converted to military products. A new list embracing cadre defence plants in most sectors of the armaments business was compiled and each Gosudarstvennyi Soyuznyi Zavod (State Union Factory) given a 'zavod number' from 1 to 56. From that time the acronym GAZ was used only for Gor'kovskii avtomobil'nyi zavod and as a prefix for its model numbers. Strange as it may seem many Western magazines and books still refer to a numbered aircraft factory as a GAZ many decades after the practice ceased in the USSR!

As can be seen from the table GAZ-1 became zavod 1 in 1927 but all other aviation plants were renumbered, most of them by having 20 added to their original GAZ number. There was a total of 12 aviation plants in Aviatrust in 1927. These were zavod numbers 1 im. Aviakhima, 22 im. X-let Oktyabrya, 23 Krasnyi Letchik, 24 im. Frunze, 25 Samolet, 26, 28 Aerotekhnicheskii, 29 Bol'shevik, 31, 32 Radio, 36 Aerolak and 41 Aviasnabbaza.

It would be a mistake to suppose that from 1927 all cadre defence factories were numbered in a single coherent system. Officially designated a Gosudarstvennyi soyuznyi zavod such a plant was given priority for raw materials and equipment furthermore workers and management were awarded higher remunerations than other types of factories. The numbering system was able to increase security by allowing production data and other performance parameters for the plants to be published in official documents without revealing their identity to people outside the government service, particularly foreigners. Certainly as rearmament increased, and particularly during World War 2, the zavod numbers were still classified as secret. Workers continued to use either the pre-revolutionary name or a new one frequently referring to the factory by its location and type of product and often adding a name to celebrate a top government or party official or an important event in the Communist calendar. For example, aeroengine zavod 24 in Moscow was popularly known from 1927 as Moskovskii aviazavod imeni M.V.Frunze. However aviation was not the only industry to number their plants, communication between different industries tenuous and old habits died hard giving rise to some duplication of zavod numbers. The Tula Oruzheinyi Zavod (TOZ) 1 retained this designation until December 1936 when it was redesignated zavod 173.

Another anomaly was the retention in official documents by a few well known factories of their original name without reference to a zavod number; the most famous example of this was the Leningradskii Kirovskii Zavod. Some sources suggest that around 1940 a special department of this famous plant was to become zavod 77 in order to build the KV-1 tank. However war intervened and it was evacuated into the Chelyabinskii Traktorny Zavod which was renamed, by order of Stalin, Chelyabinskii Kirovskii Zavod; an appellation it retained until a rebuilt plant was opened in Leningrad after the ending of the siege.

At the beginning of 1930 five repair factories belonging to Trest Promvozdukh UVVS RKKA (Trust for aircraft production of the Directorate of the Air Forces of Workers' and Peasants' Red Army) and one GVF aircraft factory were transferred to Aviatrest becoming:

zavod 35 Smolensk

zavod 39 im. Menzhinskogo – the former Aviarabotnik, Moscow

zavod 43 Kiev im. Maksima Gor'kogo, former Repair Plant No. 6

zavod 45 Sevastopol' im, Maksima Gor'kogo Repair Plant No. 2

zavod 47 Leningrad im. Maksima Gor'kogo Repair Plant No. 3

zavod 135 Khar'kovskii aviatsionnyi zavod (the Khar'kov aircraft factory) formerly of Ukrvozdukhput (Ukrainian Airlines), which had been integrated into 'Dobrolet' an airline which was the major part of the GVF on 20 January 1930 .

All were ultimately converted into substantial series production plants but initially they operated as prototype building factories with design bureaux on site. The former repair plants had been under Promvozdukh control from 18 November 1921 until 1928 but not given over to the VSNKh until 1930.

On 3 October 1931, in order to help the civil aircraft industry expand and no doubt to smooth the path to full mobilisation should that occur, nine more existing production and repair plants were established in the (Gosudarstvennyi Soyuznyi) Zavod List:

zavod 81 Tushino, later im. Molotova - former GVF repair plant no. 62

zavod 82 Tushino, - former GVF repair plant no. 163, later housed a design bureau for diesel aeroengines

zavod 83 im. Maksima Gor'kovo, Khabarovsk - former GVF repair plant

zavod 84 later im. Chkalova, Khimki - former GVF repair plant chosen for licence production of the DC-3 as PS-84 renamed Li-2 17/9/42

zavod 85 Tushino - former GVF radio plant

zavod 86 Bataisk (Marzevo) - former GVF repair plant

zavod 87 Tambov - former GVF repair plant

zavod 88 Balashov - former GVF repair plant

zavod 89 im. Gol'tsmana (ZIG), Moscow - housed TsKB (Tsentral'noe Konstruktorskoe Byuro, Central Design Bureau) GVF

Although apparently numbered in the main Zavod List, these plants remained, for the time being, under the control of the GVF and it is possible but doubtful that they formed a separate list for civil plants. The plants were handed over to direct GUAP control from 1935 and the last one, zavod 89, was redesignated opytnyi zavod (experimental factory) 240 in March 1940.

On 3 March 1930 a Vsesoyuznoe aviatsionnoe ob"edinenie, VAO, was formed within Aviatrest which itself reported to the GU metallopromyshlennosti of VSNKh. This arrangement was short-lived as Aviatrest was abolished on 15 April 1930 and totally replaced by the VAO. In June, control of the VAO passed from VSNKh to Narkomvoenmor (Narodnyi komissariat po voennym i morskim delam, SSSR). A special renumeration scheme for aviation factories was introduced on 1 October 1931.

On 5 January 1932 VSNKh was abolished and replaced by three Narodnye Komissariaty (People's Commissariats): Tyazheloi (Heavy), Legkoi (Light) and Lesnoi (Timber) Promyshlennosti (Industries). VSNKh had grown too large and unwieldy and the intention was to make smaller, more flexible management units capable of delivering the required expansion. Three Glavki and six trusts were formed within NKTP (Narodnyi Komissariat Tyazheloi Promyshlennosti) to control defence industries. VAO was replaced by GUAP (Glavnoe Upravlenie Aviatsionnoi Promyshlennosti, Chief Directorate of the Aviation Industry) and in addition the GUSP (Sudostroitel'nyoi Promyshlennosti, Shipbuilding Industry) and the GVMU (Glavnoe Voенno-Mobilisatsionnoe Upravlenie, Chief Directorate for War-mobilisation) were created. The last named controlled the arms plants. Trusts still controlled Military Chemicals, Organic Chemicals, Synthetic Fibres, Cartridges Shells and Tanks.

By July 1934 there were 17 major aviation factories within GUAP: zavod numbers 1 im. Aviakhima, 19, 20, 21 im. Ordzhonikidze, 22 im. X let Oktyabrya, 23 Krasnyi Letchik, 24 im. Frunze, 26 im. Pavlova, 28 im. Ordzhonikidze, 29 im. Baranova, 31 im. Dimitrova, 32 Moskovskii agregatnyi zavod,

33 Moskovskii karburatornyi zavod, 34 im. Postysheva, 39 im. Menzhinskogo, 125 im. Stalina and 135. There were also 4 aircraft prototype building plants: zavod numbers 35, 43 im. Maksima Gor'kogo, 45 im. Maksima Gor'kogo and 47 im. Maksima Gor'kogo .

Thus a further six plants had been acquired by GUAP since 1927:

zavod 19 im. Stalina, Perm - opened 1934

zavod 20 Moscow - aeroengine components

zavod 21 im. Orzhonikidze - opened 1932 to build fighter aircraft

zavod 33 Moskovskii karburatornyi zavod, Moscow - opened 1930

zavod 34 im. Postysheva, Moscow - opened 1931 to produce aluminium and also aircraft radiators

zavod 125 im. Stalina, Irkutsk - under construction, not opening until 1936

Zavod 32 Radio had disappeared from the scene by 1930 replaced as zavod 32 by a new plant (later called Moskovskii agregatnyi zavod) on the site of the former Duks factory which had been rebuilt on an adjacent site.

Two numbered plants had left the control of GUAP and one had been liquidated:

zavod 25 closed in 1930 and its assets transferred to zavod 39

zavod 36 Aerolak probably transferred to another GU

zavod 41 Aviasnabbaza, a saw mill, transferred to the Timber Industry in 1932.

It is worth noting that in an official list of defence factories given a wage increase in 1934 two zavod 19s appeared; apart from the zavod 19 listed above, it included a Moscow shipyard with the same number. The latter had disappeared from a similar list in 1936 probably because, as a river shipyard it was no longer considered a cadre defence plant. The second zavod number 19 probably derived from a separate list of shipyards operated by Glavrechtrans (Chief Directorate of River Traffic)

The next reorganisation took place in 1936 when NKTP was replaced by NKOP (Narkomoboronprom, People's Commissariat for the Defence Industry). Growth of the defence industry had been so extensive that NKOP required 7 Glavki, 1 Vsesoyuznoe Ob"edinenie (VO, All-union Association) plus 2 Trusts to manage it. Extra help was provided by the Central Institute of Labour (TsNII truda). The 7 Glavki were: GUAP, for aircraft production; Glavmorprom, shipbuilding; GUPV (GU Voennoi Promishlennosti, CD Military Industries) for arms; GUP (GU Boepripasov) munitions; Glavorgkhimprom, organic chemicals; Glavazot, explosives and Glavesprom, low power electrical industry for radios etc. The Precision Instrument Industry was managed by VOTI (VO zavodov tochnoi industrii) with the Vsesoyuznyi Akkumulyatotnyi Trest controlling production of electricity sources and Spetsstal' special steels.

By this time the number of aircraft manufactured had risen from 2509 in 1932 to 4270 in 1936 and the number of aviation factories handed over by NKTP to the newly formed NKOP was 46, a significant increase on the 21 of 1934. This total included two plants of the 'Trest Ustanovka'; 'Dirzhablestroï' (became zavod 207 in 12/36) at Dolgoprudnyi and Moscow's chemical weapons zavod 145, which formerly made metal components. However the overall increase in the number of aviation plants was not limited to new factories that were operational. It also contained those still under construction including some recently transferred from another government agency but now part of the GUAP network and in course of being converted. The importance of the aircraft industry can be estimated from the fact that the next largest category of defence factories was for War Chemicals which comprised 23 enterprises.

Summarising, out of the total of 46 plants taken over by the NKOP in 1936 24 have already been mentioned, and these are: zavod numbers 1 im. Aviakhima, 19 im. Stalina, 20, 21 im. Orzhonikidze, 22 im. Gorbonova, 23 Krasnyi Letchik, 24 im. Funze, 26 im. Pavlova, 28 im. Ordzhonikidze, 29 im. Baranova, 31 im. Dmitrova, 32 Moskovskii agregatnyi, 33 Moskovskii karburatornyi, 34 im. Postysheva, 35, 39 im. Menzhinskogo, 43 im. Maksima Gor'kogo, 45 im. Maksima Gor'kogo, 47 im. Maksima Gor'kogo, 125 im. Stalina, 135, 145 im. Kirova, 154 im. Stalina and Dirzhablestroï (soon to become 207).

The extra 22 GUAP plants in 1936 were:

zavod 16 Voronezh - converted from agricultural equipment at first to build ground attack aircraft and later aeroengines.

zavod 18 Voronezh im. Voroshilova – all-metal bomber factory

zavod 25 im. Ordzhonikidze, Moscow - a new plant opened in 1936 making special machine tools

zavod 27 Kazan' construction or conversion started 1936 and opened 1939 - aeroengine manufacture

zavod 30 Ivankovo (today Dubna), Moscow oblast – under construction for licence production of Martin flying boats

zavod 49 Berdyansk, Dnepropetrovsk oblast, machine tools

zavod 81 Tushino - former GVF repair plant

zavod 83 im. Maksima Gor'kovo Khabarovsk - former GVF repair plant

zavod 84 Khimki (Moscow) - former GVF repair plant being converted to build transport aircraft

zavod 95 Kuntsevo (Setun'), Moscow oblast - rolling mill for aircraft components

zavod 99 Ulan Ude opened 1936 - aircraft repairs

zavod 115 Moscow - experimental plant for the Yakovlev design bureau

zavod 116 Pereyaslavl-Zalesskii, Moscow oblast - under construction but never completed; zavod number later given to Arsen'ev (Semenovka) repair plant which was converted for aircraft production

zavod 119 Moscow - aircraft undercarriages

zavod 120 Balashika, Moscow oblast - metal foundry for aircraft components

zavod 124 Kazan' - aircraft manufacture

zavod 126 Komsomolsk na Amure - bombers and later fighters

zavod 132 Khodynka (Moscow) former Promvozdukh Repair Plant No.1 - converted to make aircraft components

zavod 149 Irkutsk – aeroengines, some sources say renumbered 19bis in 2/36

zavod 150 Stupino, Kashira raion, Moscow oblast (Stroitel'nyi Kombinat N150) - non-ferrous metal rolling plant which also manufactured propellers and U-2 aircraft

zavod 153 Novosibirsk - former mining equipment plant Sibmeshstroi but in 1938 renamed im. Chkalova; converted for aircraft production and partially opened 1937

zavod 156 Moscow, former ZOK (Zavod opytnykh konstruktssii), now experimental factory of Tupolev which split from TsAGI (Tstsentral'nyi aerogidrodinamicheskii institut, Cental Aero- and Hydrodynamics Institute) in July 1936.

It is interesting to note that numbers 18 through 35 in the zavod list were all aviation plants.

In December 1936 a very large number of plants were given zavod numbers and transferred into NKOP including 17 plants for GUAP:

zavod 191 'Radiolampa', Shchelkovo, Moscow oblast

zavod 193 'Radio zavod', Khar'kov

zavod 197 im. Lenina, Gor'kii, radio and telephone equipment

zavod 203 Moskovskii radiotekhnicheskii zavod - radios for tanks and aircraft

zavod 207 Dolgoprudnyi, former Dirizhablestroi Trest plant, airships and later experimental aircraft

zavod 208 Leningradskii radiotelegrafnyi zavod im. Komintern - radios

zavod 210 im.Kozitskogo Leningrad - radios

zavod 211 'Svetlana', Leningrad - thermionic valves

zavod 212 'Elektropribor' Moscow (Kutozovskii) - instruments

zavod 213 'Aviapribor', Moscow (Fili), - instruments

zavod 214 'Metron', Moscow - instruments

zavod 218 'Pirometr', Leningrad - instruments

zavod 219 Balashikha, Moscow oblast - metallic aircraft components

zavod 224 'Metpribor', Leningrad - instruments

zavod 230 'Tizpribor', Moscow (Grusinskaya) - instruments

zavod 236 'Saratovskii zavod svintsovykh akkumulyatorov', Saratov, batteries; transferred to NKSP in 1940

zavod 238 'Tochizmeritel' - Moscow, instruments

Note the large number of instrument plants that had been given over to the control of the GUAP; other Glavki also benefited by the same process. This was occasioned by a determination in central government to make the defence Glavki as self-sufficient as possible ensuring that not only were they in control of their own destiny but also that they could be held to account. However some factories making electrical instruments were transferred to NKEP in 1940, particularly those supplying more than one Narkom.

As a response to the rapid rearming of Nazi Germany and Japan plus the influence of the Spanish Civil War the USSR, like many other European countries, increased the rate of growth of its defence industry and on 11 January 1939 made yet another reorganisation. The NKOP was deemed too large and cumbersome to manage more expansion effectively and was dissolved, to be replaced by four People's Commissariats: NKAP (Narodnyi Komissariat aviatsionnoi promyshlennosti) for aircraft production, NKSP (NK sudostroitel'noi promyshlennosti) for shipbuilding, NKV (NK vooruzheniya) for armaments and NKB (NK boepripasov) for munitions. At this time the NKAP controlled 86 factories, NKSP 41, NKV 38 and NKB 53. Furthermore, to force the pace of building and expansion of plants, all NKs controlled 5 Construction Trusts, with the exception of the NKV which had only 4.

The total figure of 86 aviation factories in January 1939, quoted by N.S.Simonov in 'Voenno-promyshlennyi kompleks SSSR b 1920-1950-e gody' as the number received by NKAP, represents an increase of 40, ie a growth of 87%, since 1936. Of these 17 were added in December 1936. It is very difficult to specify the remaining 23 factories because of the numerous plants still under construction, some of which had started manufacturing in very small quantities and may, or may not, have been included. What is certain is that in the next few years many more factories were converted from civil work to the production of aviation equipment and the construction of new plants continued at an even faster pace.

As a full list of NKAP factories will be given later for June 1941 therefore to avoid undue repetition a similar list for January 1939 will not be shown. However below are listed the 23 plants belonging to the NKAP but not previously mentioned:

zavod 118 Moscow - aircraft components
 zavod 131 Kutaisi Georgia - aircraft repairs
 zavod 134 Balashikha - aeroengine components
 zavod 155 Khar'kov - instruments
 zavod 158 Khar'kov - electrical equipment
 zavod 163 Irkutsk - wooden components
 zavod 164 Leningrad - aircraft components
 zavod 165 Dnepropetrovsk - propellers and skis
 zavod 166 Omsk - under construction as aeroengine plant but opened 1941 as aircraft plant
 zavod 167 Kuntsevo - propellers
 zavod 168 Ryazan' - aircraft components and repairs later gliders (today ARZ 360 VVS)
 zavod 169 Kazan' - wooden components
 zavod 241 Moscow (Bykovo) - repairs (today ARZ 402 GA)
 zavod 242 Khar'kov - repairs
 zavod 243 Tashkent - repairs
 zavod 244 location unknown - repairs
 zavod 245 Kiev - repairs
 zavod 261 Moscow - undercarriages
 zavod 278 Teplopribor, Leningrad - instruments
 zavod 289 Podlipki - opytnyi zavod and design bureau of Shcherbakov
 zavod 291 Tushino - aeroengine parts
 zavod 292 Saratov - former Sarkombain farm machinery plant converted to aircraft production 2/38
 zavod 301 Khimki - aircraft

It can only be surmised why, in April 1940, 11 NKAP electrical equipment factories, zavod numbers 191, 193, 197, 203, 208, 210, 211, 330, 331, 332 and 379 were transferred to the NKEP (NKElektroPromyshlennosti, People's Commissariat for the electrical industry). A plausible explanation is that, as well as the air force, the army and navy also required products from these plants. Zavod numbers 330 Ryazan', 331 Murom, 332 Khar'kov and 379 Leningrad had only been handed over to NKAP shortly after its formation.

By the time the Germans invaded in June 1941 about 238 aviation factories were in production or being built. This is a huge increase of 152 on the 86 noted in 1939 and is indicative, not only of the determination of the Soviet government to re-equip and expand its air force, but also of a very complex situation. A surprising number of factories under construction either never reached completion or underwent a role change. Other factories were undoubtedly being planned in 1939 but not recorded in the total. Considerable numbers of existing plants on less important work were transferred to the NKAP for conversion and often for extension. Nonetheless the programme was a daunting one and the recruitment of management and the training of the skilled workers a nightmare.

The initial success of the German invasion in June 1941 necessitated evacuation of 100 aviation factories. In the face of this adversity the Soviet aviation industry still managed to increase the number of aircraft built from around 10,500 in 1940 to over 15,000 in 1941 and to 25,000 plus in 1942. Aviation was, of course, not the only industry affected and evacuation and subsequent recovery of the Soviet defence industry was one of the greatest, if not the greatest economic achievement by any nation in World War 2.

The 238 factories listed in the table below are those thought to belong to the NKAP in June 1941 but there may be others which have not yet been traced. In the 'Other details' column a short history, where known, is given for each factory but the types of aircraft and engines indicated are only those built up to the time of evacuation in 1941. It is interesting to observe that one management stratagem was the placement of a new, and usually smaller, plant as a 'filial' (branch) under the management of a well established factory. Another ploy to indicate that a plant a twin of a numbered zavod was to use the designation 'bis' instead of issuing a new number. In both instances many of the subordinate factories became independent and received their own number after proving their worth.

There are 9 examples in the table of zavod numbers being duplicated (Nos 27, 169, 279, 280, 287, 470, 472, 487 and 490); no official explanation has been given for this but it is probable that during the chaotic situation clerical errors occurred in typing or resulted in the omission of 'filial' or 'bis' designations from the records.

Numbered Factories of the NKAP June 1941

Zavod No.	Name	Location	Other details
1	im. Aviakhima	Moscow (Khodynka)	'Duks' factory 1909, GAZ-1 1918-27 & 'zavod im. ODVF' from 1923-5 then zavod im. Aviakhima; from 1927 zavod 1; built I-2, I-2bis, I-3, I-4, I-5, I-7, I-15, I-15bis, I-153, DI-6, MiG-1, MiG-3, BB-2, R-1, R-5 and R-Z aircraft; moved 1930-1 to a new adjacent site; p/ya 2402 (1936) and p/ya 208 (1939); evacuated Kuibyshev 10/41; Khodynka site used as aircraft repair workshop until rebuilt as zavod 30 which opened from 12/41
3		Orekhovo-Zuevo, Moscow oblast	developed breathing apparatus for high altitude aircraft in 1940
11		Poltava, Ukraine	received from NKOM in 1940; site became zavod 488 in 1944 and transferred to NKES
16		Voronezh	built 1928, given number in 1930, converted in 1931 from agricultural equipment to ground attack aircraft but after building ten TSh-2 converted to aeroengines; M-11 and M-105 engines were produced along with Renault MV-4, MV-6 and MV-12 manufactured under licence; p/ya 152 (1937); evacuated 9/41 to Kazan' where it absorbed zavody 27 and 82; Voronezh site used for zavod 444 which was liquidated 4/42 and then for zavod 256 in 1943
16 filial		Voronezh	former im. Stalina NKTМ transferred to NKAP to produce M-11 aeroengines
18	im. Voroshilova	Voronezh	TB-3, RD, SAM-5, ANT-25, TB-3, K-12, K-13, Er-2, Il-2 and DB-3 aircraft; p/ya 71 (1937); evacuated 10/41 to Kuibyshev onto site of incomplete zavod 295 which was absorbed; zavod 64 opened on old Voronezh site in 2/42, noted as repair plant 4/43 but later built first components and then ground attack, bomber and transport aircraft
19	im. Stalina	Perm'	opened 1934, and built M-25, M-62 and M-82 aeroengines; a/ya 211 (1944); acquired resources from Buessing (Walbek), 1946; now AO 'Permskie motory'
20		Moscow	aeroengine components; p/ya 4217 (1937); evacuated 10/41 to Omsk onto site of farm machinery plant 'im. Kuibysheva'; repair plant opened on Moscow site in 1/42 as zavod 451 built aeroengine components from 1943 and 'special aviation products' (probably rocket components) postwar
20bis			under construction in 1940
21	im. Ordzhonikidze	Gor'kii, now Nizhnii Novgorod	LaGG-3, I-5 and I-16 fighters; received number 7/29 but was plant A before that; fully opened 1932; p/ya 200 in 1937 and in 1944; accommodated zavod 119 as an independent branch 11/41; APO im. Ordzhonikidze in 1975; now AO 'Sokol'

22	im. S.P.Gorbunova (from 1933)	Moscow (Fili)	'Russko–Baltiiskii zavod' from 1916, then GAZ-2 (A=automobiles) and '1-i BTAZ' in 1918; later built aircraft, ANT-1, ANT-9, R-3, R-6, Kr-6, Kr-6A, I-4, TB-1, TB-3, DB-A, Pe-2, PS-35 and SB at first as GAZ-7 (now A = aircraft); renumbered zavod 22 im. 10 let Oktyabrya in 1927 and im. S.P.Gorbonova from 1933; p/ya 222 (1940); evacuated 9/41 to Kazan' and absorbed zavod 124 12/41; from 7/42 Moscow site used for zavod 23, renamed zavod 23 im. Khrunischeva in 1961
23	Krasnyi Letchik	Leningrad, now St Petersburg	former aviation part of 'Russko–Baltiiskii zavod', then 'Petrogradskii ob"edinenniii zavod' and in 1922 'Krasnyi letchik'; GAZ-3 (aircraft) 1923 and zavod 23 1927; I-2, LaGG-3, U-1,U-2, MU-1, UT-2 and AIR-6 aircraft ; p/ya 493 1937 and p/ya 1 1940; evacuated 6/41 to Fili onto site of zavod 22 and then in 10/41 into Novosibirsk to be absorbed by zavod 153 but also partly into Kazan' to zavod 27; zavod 272 formed on the Leningrad site in 9/44 to produce aircraft components and later fighters and is currently 'Severnyi zavod' making AA missiles
24	im. Frunze	Moscow	Gnome-Rhone factory from 1912, then in 1920-1 GAZ-2 'Ikar'; absorbed GAZ 4 and renumbered zavod 24 im. Frunze 2/3/27; built M-4, M-5, M-6, M-11, M15, M-17, M-26, AM-34, AM-35, AM-37, AM-38, M-62 and M-63 aeroengines; p/ya 2351 (1936) and p/ya 299 (1937); absorbed evacuated zavod 452 mid-1941 but itself evacuated in 9/41 to Kuibyshev onto the sites of zavody 337 and 377 absorbing them; zavod 45 formed on the Moscow site in 1942 and also, reportedly, zavod 337
25	im. Ordzhonikidze (from 1936)	Moscow	made special machine tools in 1940; p/ya 2355 (1936); evacuated first to Molotov and then to Ul'yanovsk absorbing zavod 283
25 filial		Moscow	aeroengine parts
26	im. Pavlova from 1936	Rybinsk, Yaroslavl' obl.	ex- 'Russkii Reno' works of 1916 later GAZ-3 (autos.); converted to aeroengines 1923 as GAZ-6 (aircraft); renumbered zavod 26 1927; built M-17, M-100, M-103 and M-105 types; p/ya 20 (1936); evacuated 11/41 Ufa into combine-harvester engine plants numbers 105 and 107 and aeroengine zavod 384; Rybinsk site used for new zavod 36 from 2/42
27		Moscow	founded 1916; produced propellers
27*		Kazan'	building started 1932 as Kazanstroi but zavod 124 separated from it and was finally opened in 1939 and built M-105 aeroengines; absorbed by evacuated zavod 16 from Voronezh in 9/41 and accommodated the independent zavod 82 from Moscow 10/41
27bis		Ul'yanovsk	under construction as a twin for Moscow zavod 27
28	im. Ordzhonikidze (from	Moscow (Presnya)	propellers and skis; based on former furniture plant of Mure and Merelize; named Propeller and also Aerotekhnicheskii; accommodated OKB of Rishar; p/ya 2263 Lopast' (1936);

	1936)		10/41 evacuated to and absorbing furniture plant in Sverdlovsk; Moscow site used for zavod 27 from 1/42
29	im. Baranova (from 9/33)	Zaporozh'e, Ukraine	Deka' from 1916, then GAZ no. 9 in 1920, also known as 'Bol'shevik' since 1922; M-6, M-11, M-22, M-85, M-86, M-87 and M-88 aeroengines; p/ya 18 Support (1940); evacuated to Omsk 8/41 absorbing incomplete zavod 166; part of plant transferred later from Omsk to Moscow; new zavod 478 opened 1945 on Zaporozh'e site
30		Ivan'kovo/ Podberez'e and Kimry/ Savelovo	main site at Ivan'kovo planned for flyingboats and Savelovo site used for training personnel; 3/40 Savelovo separated as z-d 288 and Ivan'kovo as zavod 30 ordered to change to Il-2 production but evacuated and 12/41 lost its independence, its equipment being transferred to zavod 23 Fili and new Moscow z-d 30; both sites reopened as OKB and zavod 458 for Chetverikov on 11/5/42 but became GOZ-1 (State Experimental Plant) on 17/4/46 for German jet aircraft engineers
31	im. Dimitrova (from 1934)	Taganrog	Lebedev plant 1916 & 'Lebed' since 1920, then GAZ-10 (aircraft) 1920 & zavod 31 1927; built aircraft, mostly seaplanes, R-1, R-6, MR-1, TB-3, MBR-2, MDR-4, MDR-6, ANT-9, LaGG-3 and Sh-2; p/ya 19 Tekhnika (1940); evacuated 10/41 to Tbilisi absorbing zavody 45 & 448; Taganrog site reopened as zavod 86 in 9/43
32	Moskovskii Agregatnyi	Moscow (Khodynka)	aircraft ordnance; formed on site of original zavod 1 'Duks' as Stankolit; numbered 10/31; absorbed ANII in 1936; p/ya 2497 Kvadrat (1940); accommodated four KB; evacuated 10/41 Kirov onto site of zavod 315 absorbing it and retaining number 32; Moscow site reopened for zavod 43 in 11/41
32bis		Syzran', Kuibyshev obl., now Samara obl.	under construction 1940
33	Moskovskii Karburatorn yii zavod	Moscow	aeroengine components and carburettors, opened 1930 after separation from zavod 1 im. Aviakhim; p/ya 101 (1936) and p/ya 224 (1940); evacuated 10/41 to Molotov (now Perm') onto site of zavod 339 and absorbed losing number, which was restored soon after; Moscow site became zavod 315 4/42
34	im. Postysheva	Moscow	formed 1931 within zavod 1 site; aluminium and aircraft radiators; p/ya 2408 (1937-40); became independent z-d 34 when zavod 1 moved to Khodynka later in 1931; evacuated Troitsk, Chelyabinsk obl. to site comprising a vegetable oil plant, a brewery, and a veterinary laboratory 10/41; Moscow site became zavod 124 in 1942
34bis		Kuznetsk, Penza obl.	aeroengine components; absorbed by zavod 472 when evacuated from Moscow 10/41
35		Smolensk	former Promvozdukh UVVS repair plant, 1926-8; in 1930s housed BOK and built aircraft prototypes; given number in 1928 or 1930; p/ya 39 (1940); evacuated to Vyazma and dissolved 6/41; some equipment evacuated Kuibyshev 6/41 into

			zavod 122, which, shortly after, was itself absorbed by z-d 1 (some sources suggest z-d 122 was renumbered z-d 35 before being absorbed by z-d 1); Smolensk site reopened 3/44 as zavod 475
36	Aerolak	Moscow	former Kokha and then GAZ-16 before becoming zavod 36 in 1927; paints and varnishes
39	im. Menzhinskogo (from 1927)	Moscow (Khodynka)	ex- Promvozdukh UVVS Trust 'Aviarabotnik' 1921-30; absorbed zavod 25 in 1930; housed OGPU 'VT' design section from 2/30, TsKB here 1930-31 and TsKB GUAP (TsKB-39) formed 2/33 for prototypes; absorbed zavod 133 11/33; p/ya 2400 (1940) later 41; also series production of I-Z, I-15, I-16, DI-6, Pe-2, and DB-3; evacuated 9/41 to Irkutsk but original site used for aircraft repairs and assembly as zavod 81 from 1/42; zavod 81 absorbed by in-coming zavod 381 4/43 but zavod 81 designation given to new small opytnyi zavod later opened in grounds of zavod 381
43	im. Maksima Gor'kogo	Kiev, Ukraine	GAZ-12 from 1920-2 & Promvozdukh UVVS repair plant no. 6 in 1922; then repairs and prototypes as zavod 43 from 1930 also built small series of R-10; accommodated KB Tairov; p/ya 11 (1940); evacuated 7/41 to Novosibirsk into zavod 153 and then to Omsk into zavod 166, losing its identity; site reopened 11/43 as repair zavod 473
45	im. Maksima Gor'kogo	Sevastopol'	former Promvozdukh UVVS repair plant no. 2; zavod 43 since 1930; prototype seaplanes; p/ya 25 (1940); evacuated 8/41 to Tbilisi onto site of zavod 448 and absorbed by incoming zavod 31 12/41 itself partly evacuated to Baku into zavod 163; Sevastopol' site transferred to NKVMF 4/44
47	im. Maksima Gor'kogo	Leningrad, now St Petersburg	former Promvozdukh UVVS repair plant no. 3 but from 1939 built UT-2 trainers; p/ya 936 (1940); evacuated 8/41 to Chkalov (now Orenburg) onto site of repair plant of Chkalovskaya aviation school; zavod 273 formed on original Leningrad site in 1944
49		Balashikha, Moscow obl.	remontno-mekhanicheskii z-d; built in 1936 as aircraft repair plant; evacuated to Ufa onto site of z-d 384 or 268 10/41; restored in Balashikha 2/42; 26/1/43 became tank repair z-d 24
51		Moscow (Khodynka)	opened 6/40 as the opytnyi zavod of N. Polikarpov on part of the old site of zavod 1; intended to be opytnyi zavod 100 but redesignated to avoid duplication; OKB evacuated 10/41 into zavod 153, Novosibirsk; original Khodynka site used as repair plant but in 8/43 OKB returned; after death of Polikarpov in 1944 used as cruise missile OKB (Chelomei); from 1953 filial OKB zavoda 155; from 15/1/54 the former OKB-1 of Sukhoi came here as OKB zavoda 51; renamed MZ 'Kulon' in 1966 and MMZ im. P.O.Sukhoi in 1975; from 1996 ANTK OKB Sukhogo
61		Moscow	1939-40 built ramjets designed by Merkulov; 1945 experimental plant for jet/rocket engines;

81	im. Molotova (another source has im. Vodopyanov a)	Moscow (Tushino)	former GVF repair factory no. 62, 1932-6; to NKOP as zavod 81 in 1936; Stał-2, Stał-3, DI-6, Yak-4, and UT-3 aircraft built; p/ya 1309 (1937) and 2400 (1940); accommodated KB-70 of Kurbala in Spring 1940; site given to zavod 1 19/07/41; evacuated 10/41 to Omsk and absorbed by zavod 156 an independent part of zavod 166; Tushino site rebuilt 3/42 as zavod 82
82		Moscow (Tushino)	ex-GVF Repair Plant No.163 1932-8 when it became zavod 82, and the OKB for diesel aeroengines; later OKB became sharashka; evacuated 11/41 Kazan' into zavod 16; independent till 3/42 when returned to new site in Tushino merging with zavod 45 to become new zavod 500; zavod 453 housed on Tushino site of zavod 82 until formation of zavod 500 when it transferred to site of evacuated zavod 261 as a filial of zavod 165
84	im. Chkalova	Moscow (Khimki)	fomer GVF repair plant since 1932, became zavod 84 in 1935; accommodated KBs of Levkov and Bolkhovitinov; PS-84 (later redesignated Li-2) aircraft produced; evacuated 10/41 Tashkent onto site comprising Aeroflot repair plant No. 34, a printing shop and a sawmill 'Chirchikstroï'
85		Moscow (Tushino)	former GVF radio plant; later absorbed by zavod 82 and evacuated 1941
86		Bataisk (Marzevo)	former GVF repair plant, numbered zavod 86 c. 1937; evacuated 1941
87		Tambov	former GVF repair plant
88		Balashov	former GVF repair plant
95		Setun', Moscow obl.	rolling mill for aircraft components; p/ya 776, 1940; evacuated 10/41 Verkhnyaya Salda onto site of zavod 491 together with zavod 150; Setun' site now VILS
96		Gor'kii, now Nizhnii Novgorod	under construction 1936
99		Ulan Ude	aircraft repairs 1936-9 became filial zavoda 39 Irkutsk in 1941 making aircraft assemblies then independent zavod building aircraft and, postwar, helicopters; p/ya 7, 1942; now AO 'Ulan-Udenskii aviatsionnyi zavod'
103		Kuibyshev (Bezym- yanka), now Samara	aircraft (director Tavashyano)
111		Gor'kii, now Nizhnii Novgorod	aircraft undercarriages; now AO 'Gidromash'
115		Moscow	experimental factory and Yakovlev OKB; evacuated 10/41 into zavod 153, reopened starting from 3/42; p/ya 1303 (1943) now AO 'OKB im. A.S. Yakovleva'
116		Arsen'ev	former Semenovka repair plant; p/ya 1/16 (1940-2); aircraft

		(Semenovka)	components in 7/40 and from 1941 aircraft; postwar missiles and helicopters; now 'aviakompaniya "Progress" im. N.I. Sazykina'
117	Krasnyi Oktyabr'	Leningrad, now St Petersburg	general engineering, converted to aeroengines 1940; evacuated 8/41 Ufa into zavod 26; Leningrad site still manufactured weapons, and reopened 1946 as experimental aeroengine plant and Klimov OKB with part of plant separated as 'Krasnyi Oktyabr'' and which changed onto rocket production in the 1960s; now NPP 'zavod im. V.Ya. Klimova'
118		Kamyshin, Stalingrad, now Volgograd oblast	aviation instruments; under construction 1940
119	im. G.M. Malenkova	Moscow	built 1915; named after Malenkov 6/40; aircraft wheels and undercarriages; p/ya 307, 1940; absorbed 1st Vasovoi zavod 1/41; evacuated 10/41 onto site of 'Gudok Oktyabrya', Gor'kii oblast as filial zavoda 21 but in 11/41 moved onto site of zavod 21 still as a filial
120		Balashikha, Moscow obl.	metal components, such as aircraft wheels, from foundry (which subsequently separated to become zavod 219); evacuated 1941 mostly into zavod 120bis on part of site of zavod 183, Nizhnii Tagil but also onto site of the filial at zavod 286 at Kamensk
120bis		Nizhnii Tagil	wheels and other aircraft components; under construction in 1940 on site of zavod 183; received part of evacuated zavod 120 from Balashikha 11/41 and absorbed zavod 261 in 4/42 as its Berezovsk filial; became independent again as zavod 261 in 3/43 but was itself absorbed by z-d 286 in 11/45 its site given to zavod 183 NKTankProm
121		Balashov	aircraft plant under construction 1940
122		Kuibyshev, now Samara	under construction as zavod 122 in 1940; before completion received Tairov OKB and absorbed evacuated zavody 35, 295, 382, 453, 463, 464 and 465 in 7/41; itself absorbed by evacuated zavod 1 before opening in 10/41
122bis		Kuibyshev, now Samara	
123		Kamensk Shakhtinskii or Millerovo, Rostov obl.	aircraft factory under construction in 1940 but not completed; received resources resulting from the stopped construction of z-d 335 3/41; used as a warehouse for imported explosives from 25/7/44
124		Kazan'	bomber aircraft, TB-7 (Pe-8), Pe-2 from 1941; p/ya 732 (1940); zavod 27 plant split off in 1941; accommodated special design group of Nadiradze in 1941; absorbed 9/41 by evacuated zavod 22; independent again as zavod 124 again from 12/11/41 to build TB-7 bombers but re-absorbed 23/12/41
125	im. Stalina	Irkutsk	1936 started building I-14 and from 1937 SB aircraft; p/ya 11

		(1940); absorbed 10/41 by evacuated Moscow zavod 39
126	Komso- mol'sk na Amure	started building R-6 aircraft in 1936 and DB-3 from 1939; p/ya 40 (1942); now KNAAPO im. Yu.A. Gagarina'
127	Ul'yanovsk	aircraft; under construction in 1940 and received resources from liquidated zavod 335 in 3/41
128	Atkarsk or Rtischshevo- Angarsk	aircraft; under construction in 1940
129	Ulan-Ude	aircraft; under construction in 1940
130	Komso- mol'sk na Amure	aircraft components plant, under construction before war and opened 1942; p/ya 52 (1942); some of its shops transferred to NKSP 6/46; absorbed by zavod 126 c. 1958
131	Kutaisi, Georgia	filial of Tbilisi zavod 448; instructed by NKAP 26/8/41 to prepare to start making Yak-1s from 11/41; given , in 1942 as a filial to zavod 31, Tbilisi after the latter had absorbed zavod 448; noted on aircraft repairs in 1944
132	Moscow (Khodynka)	former Promvozdukh UVVS repair plant No. 1 later aircraft components; evacuated Sim, Chelyabinsk obl. absorbing zavod 444 in 10/41; Moscow site used as repair shop
132bis	Moscow	aircraft assemblies; under construction in 1940; evacuated to Verkhnyaya Salda 10/41
133	Leningrad, now St Petersburg	formed in 1940 on site of stables to make aeroengine components as filial of zavod 28; p/ya 981 (1940) evacuated to Saratov 6/41 onto site of zavod 306 and together with zavod 456 absorbed by zavod 306; restored 2/42 but not operational; became zavod 794 4/45
134	Balashikha, Reutov, Moscow obl.	aeroengine components; under construction in 1940 as a twin of zavod 25; may have been redesignated zavod 121 before completion but evacuated Kazan' 1941
135	Khar'kov (Sokol'niki), Ukraine	'Khar'kovskii aviatsionnyi zavod'; former Ukrvozdukhput plant (since 1924), transferred to GUAP 11/29, as KhAZOS from 1932 and zavod 135 c.1935 ; prototypes, later built series aircraft including K-5, K-5, I-Z, IP-1, R-10 and Su-2; p/ya 135 (1940); built experimental. submarine; evacuated to Molotov (Perm') 10.41 and dissolved there 1/42, its facilities transferred to zavody 23 and 25, Moscow, and zavod 381, N. Tagil'; Khar'kov site reopened 8/43 on receiving and absorbing zavod 480; 1946 received resources from Wiener Scheustadt and an aircraft components plant Neuen-Knerche, Vienna; now Khar'kovskoe APO (KhAPO)
145	im. Kirova	Moscow
		former Ustanovka Trust plant; aircraft armament components and chemical warfare; p/ya 119 (1940); evacuated to Kuibyshev onto site of zavod 455 11/41 and absorbed it 1/42;
149	Vyazma, Smolensk obl.	instruments; under construction in 1940; evacuated Ul'yanovsk on site of zavod 280, absorbed and lost number 9/41

149		Moscow	operated till 9/44 when it became zavod 295
150	Stupinskii Metallurgicheskii	st. Stupino, Kashira, Moscow obl.	kombinat 150; propellers, non-ferrous rolled metal, 1937-9 built UT-1 training aircraft; divided 7/41 into two - metal and aircraft; later in 1941 part evacuated to Kamensk, Chelyabinsk obl. onto site of zavod 268 then under construction, and part to Kuibyshev onto site of zavod 18 (this part became zavod 35 later), and also part to Stalinsk; restored 2/42 due to inability to launch metal production in Kamensk; p/ya 23 (1944); in 3/44 became prototype propeller zavod 25 after absorbing zavody 28, 35 and 132; 1946 received resources from Heinkel (Rostok), Bertowerke (Lange) and propeller equipment from Halbau and Durener Metalwerke (Schwerin); part of factory site transferred with equipment to zavod 120 in 3/46; now AO Stupinskii metallurgicheskii kombinat
153	Sibmashstroi , from 1938 im. Chkalova	Novosibirsk	started production in 1936 I-14 fighters switching in 1937 to I-16 (also UTI-4 trainers) and in 1941 to the LaGG-3 and Yak-7; a converted mining equipment plant Sibmashstroi opened 1936 and fully operational 1938; p/ya 1110 (1940-42); should have absorbed evacuated zavody 23, 45, 301, 388 but it did not happen instead absorbed opytnye zavody 51 and 115 9/41; p/ya 202; accommodated OKB-153 which was formed from evacuated OKB zavoda 115; now NAPO im. Chkalova
154	im. Stalina	Voronezh	aeroengines, opened 1928 as filial zavoda 16 until 3/41 when renumbered; p/ya 125 (1940); evacuated 10/41 to Andizhan onto site of cotton plant 2; reopened 3/46 in Voronezh on site of zavod 265; missile engines from 1967; now 'Voronezhskii Mekhanicheskii zavod'; note zavod 265 also built on site of evacuated zavod 16
155		Khar'kov, Ukraine	instruments; under construction in 1940; evacuated Sverdlovsk together with zavody 214 and 382, losing its number when it became part of zavod 214; zavod 157 formed on site of the evacuated plant 10/43
156		Moscow	experimental factory based at TsAGI since 1933; received number 12/36; p/ya 116 (1939); in 1940 zavod 290 was split off for OKB Kamov; evacuated 7/41 to zavod 166, Omsk; Moscow site repaired aircraft until restored as zavod 156 in 1942; p/ya 116 (1942); Tupolev OKB returned 1943; zavod 225 split off in 1943; now AO 'aviatsionnyi nauchno-tekhnicheskii kompleks im.A.N.Tupoleva'
161		Moscow	former plant of NKL transferred to NKAP 7/40; propellers and aeroengine components; p/ya 132 (1939); evacuated Ufa 11/41 onto site of zavod 282 or Aremz as zavod 161 and partly to Saratov onto site of zavod 306; site used as zavod 480 10/41 to 2/42 and later by zavod 828 NKMV
162	im. Khalturina	Leningrad, now St Petersburg	propellers; former furniture plant im. Khalturina, not evacuated; p/ya 162 (1942); together with zavody 201 and 26 formed 6/43 special shops to repair wooden skins of Yak fighters and Il-2s; received resources of Wilhelm Bekker in 1945; later transferred to NKL

163	Irkutsk	wooden aircraft components; developed wooden wings for I-16 fighters which were tested at Novosibirsk filial of TsAGI in 1942
164	Syzran, Kuibyshev obl., now Samara obl.	aircraft skis; received zavod 32 but absorbed by evacuated zavod 481 12/41
164	Leningrad, now St Petersburg	aircraft components; after war, radar equipment
165	Dnepropetrovsk, Ukraine	propellers and skis; ordered to start LaGG-3 production 1941 supported by Yatsenko KB; evacuated Saratov onto site of zavod 292 and absorbed and lost number 8/41; part of equipment transferred to other plants
166	Omsk	under construction as aeroengine plant but still produced skis for z-dy 124, 39, 18 & 126; formally opened 24/7/41; received automotive trailer zavod 6 9/8/41; absorbed evacuated zavody 81, 156 27/7/41 (NKAP) though last cargoes were received 8/42; Tupolev OKB as part of TsKB-29 NKVD and other OKBs also evacuated here 8/41; when z-d Zaporozh'e z-d 29 came 8-9/41 site was given to it and became z-d 29 while z-d 166 received territory of 'Avtooboruchnyi z-d (ASZ) im. Komintern' (filial GAZ), and 'Z-d avtopritsepov (ZAP) im. Komintern'; received some personnel of z-d 288 12/41 while z-d 288 retained independence and was accommodated on another site; p/ya 7 (1944); its filial in Kolomzino (z-d 266) was used by Beriev OKB and OKBs Myasishchev and Tomashevich; received resources from Karl Klemm (Dresden) in 1946; during WW2 built bombers and fighters but later airliners and space equipment; became 'Omskii aviazavod' (OAZ) in 1965; now PO 'Polet'
167	Kuntsevo, Moscow obl.	propellers, opened 1938; evacuated Saratov 10/41 onto site of zavod 292 or Voenstron plant and absorbed zavod 449 7/42 but was itself absorbed by evacuated zavod 213 from Engel's; Kuntsevo site given to zavod 164 in 2/42
168	Ryazan'	aircraft repairs, components, propellers and from 6/41 Tsybin gliders; evacuated 1941 to Rostov na Donu, then to Lopatino, Volzhsk, then again to Rostov in 1944; site in Ryazan' used for zavod 463
168 filial	Kozlovka, Chuvashiya	aircraft material; transferred partly into zavod 494, retaining independence, and partly to zavod 471 1/42
169*	Ryazan'	gliders and aircraft skis for DB-3s in 1940; transferred to Moscow 1/42 to produce wooden tails for Il-2 and then appeared in Kazan'
169	Kazan'	transferred to NKAP 1939; wooden aircraft components; absorbed by evacuated zavod 387 in 8/41 and lost its number
207	Dolgoprudnyi (Vodniki),	former Dirizhablestroj numbered 12/36; dirigibles and from 3/10/38 also aircraft opytnyi zavod; 1940-1 Su-2 aircraft; p/ya 1078 (1940); received from Riga evacuated zavod 464 which

		Moscow obl.	remained independent; evacuated 1941 to Molotov (Perm') and absorbed by zavod 135 which was itself liquidated 1/42 and some equipment returned to Doldoprudnyi site which reopened as repair zavod 462; designation zavod 207 was given to a Kuibyshev zavod making armoured cockpits for the Il-2
213	Aviapribor	Moscow (Kutuzovskii)	in 1936 zavod 30 Aviapribor divided into zavody 213 and 230; aircraft instruments, p/ya 424 (1940); evacuated to Engel's on site of slaughter house 8/41 and then Sverdlovsk 10/41 on site of Klub im. Kominterna
213 filial		Leningrad, now St Petersburg	aircraft instruments; under construction in 1940
214	Metron	Moscow	formed 1932 as 'Metron'; numbered 12/36; aircraft instruments, evacuated 10/41 to Sverdlovsk on site of Klub im. Profinterna together with zavody 155, 382, and part of zavod 213 and absorbed them
218	Pirometr	Leningrad, now St Petersburg	opened 1932; aircraft instruments, p/ya 518 (1940); evacuated Kazan' 1941 as a filial zavod 218 and then Ramenskoe where absorbed by zavod 149; some facilities were retained in Leningrad as another filial of zavod 218 and started operations 2/42
218bis		Ul'yanovsk	under construction; aviation and naval instrument
219		Balashikha, Reutovo, Moscow obl.	aircraft components; formed as the independent non-ferrous metal casting arm of zavod 120; partly evacuated to zavody 26 and 286 the remainder merged with zavod 120 on this site retaining number 219; p/ya 845 (1942-5); accommodated combined OKB of Flerov and Zhokov given resources from BMW (Strasfurt) and Rautelwerke (Wernigerode) 1945-6; built electric motors 1945 but 3/46 became opytnyi zavod 279 for undercarriages
224	Metpribor	Leningrad, now St Petersburg	formed 1932; aircraft and naval instruments, numbered 2/37; evacuated partly to Molotov (Perm') obl. onto site of aviation college and partly to Kazan' onto site of film plant where it merged with filial of zavod 218 8/41; reopened in Leningrad by 1944
230	Elektropribor	Moscow (Grusinskaya)	formed 1933 when zavod 30 was split into zavody 213 and 230; aircraft instruments, at first called 'Tizpribor' later 'Elektropribor', p/ya 2264 (1940); evacuated 8/41 to Kazan' onto site of Veterinary institute and became filial zavody 230; Moscow site became zavod 339
230bis		Ul'yanovsk	under construction in 1940
234	Krasnyi Oktyabr'	Leningrad, now St Petersburg	tank components, motorcycles; transferred from NKSM to NKAP in 1940 to manufacture aeroengines; p/ya 736 (1940); evacuated to Ufa 7/41 on site of zavod 384 and absorbed together with zavody 338 and 451, then zavod 384 was absorbed itself by zavod 26; part of equipment transferred to other plants; from 9/42 site in Leningrad used for engine repairs

238	Tochizmeritel'	Moscow	aircraft instruments; evacuated Sverdlovsk 10/41 but restored on Moscow site 5/42
240		Moscow (Khodynka)	formed 3/40 as opytnyi z-d OKB Ermolaev, ex-GVF ARZ 89 im. Gol'tsman; evacuated Kazan' onto site of z-d 124 10/41 and later to Sverdlovsk; the Moscow site housed part of Ermolaev OKB from 1/42 with aircraft repairs as z-d 89 from 21/4/42; Il'yushin took over part of z-d 240 then z-d 89 (site A) 12/4/42 and OKB Ermolaev transferred to former site B of z-d 240 renamed z-d 134 as OKB z-da 134 for Sukhoi 7/42; z-d 134 merged with z-d 289 in Tushino 3/2/45 or 14/8/45; OKB-482 Myasishchev came from Vladykino 7/44 (and also from filial OKB-22 Kazan') using part of z-d 134 as opytnyi z-d 482; 20/2/46 Ilyushin OKB absorbed z-d 482 but z-d 134 still in site B till 11/49 when fully transferred to Tushino; part of site B and site A in Khodynka occupied by a hangar was given to NII-2 (aviatsionnogo vooruzheniya) 13/5/46; whole site B given to NII-2 12/49 when Sukhoi OKB was dissolved and OKB-134 given to Toropov; now AO 'A.K. im Il'yushina'
241		Bykovo, Moscow obl.	former GVF repair plant opened 11/1931; numbered and absorbed by NKAP 1940, accommodated KB Rafaelyants; built assault gliders; evacuated 10/41 Tyumen' on site of two city marketplaces; site reopened 1942 as GVF repair plant no. 402
242		Khar'kov, Ukraine	former GVF repair plant, evacuated Ulan Ude 1941 with some equipment going to Novosibirsk
243		Tashkent, Uzbekistan	former GVF repair plant, received part of evacuated zavod 84 from Moscow; now 'Tashkentskii zavod no. 243'
244			former GVF repair plant
245		Kiev, Ukraine	former GVF repair plant
256		Podberez'e/Savelovo, Kimry r-n, now Dubna, Moscow obl.	aircraft and gliders, reopened 1944; Tsybin OKB formed here in 5/55; accommodated OKB-155 in 1957 to develop cruise missiles
261		Moscow	undercarriages; p/ya 2382 (1940); evacuated to Berezovsk site 10/41; Moscow site reopened in 6/42 accommodating zavod 453 which was moved from site of evacuated zavod 82 where it had been formed in 4/42
265			produced aerodrome equipment in 1939
266	im. Lespe	Moscow	generators and transformers; transferred from NKEP to NKAP 3/39; received and absorbed zavod im. Dzerzhinskogo in 1940; p/ya 2352 (1940); evacuated Berdsk, Kirov obl. onto site zavod 461 11/41 and absorbed it and zavod 476; Moscow site used by NKMV till 1945 when converted for civil goods
266bis		Moscow	under construction in 1940, evacuated 10/41 to Tomsk onto site of Tomskii elektromotorni plant of NKEP

268		Kamensk-Ural'skii, Chelyabinsk obl.	aluminium plant also made part-finished products; the only 'Elektron' (magnesium alloy) plant; under construction till 4/40; received zavod 150 and absorbed it; p/ya 4 (1944); now AO 'Kamensk-Ural'skii Metallurgicheskii zavod'
269		Kirsa, Kirovsk obl.	formed in 1939 based on site of NKMP plant; rolled steel and aluminum; p/ya 10 (1942); transferred to NKEP 10/45 and changed to cables; now AO 'Kirkabel'
272		Leningrad, now St Petersburg	not recorded as having produced any aircraft, therefore probably still under construction, it was evacuated to Kazan' in 1941; reformed on site of evacuated zavod 23 9/44 to produce parts and components for fighters; received OKB Moskalev from zavod 273 in 1945; received equipment from Focke-Wulf plants (Poznan and Birnbaum); received OKB Chetverikov 6/46 and prototype plant became zavod 458
275		Leningrad, now St Petersburg	radio nav aids
278	Teplopribor	Leningrad, now St Petersburg	former Teplopribor; instruments; stayed in Leningrad but partly evacuated to Ul'yanovsk where absorbed by zavod 280; p/ya 579 (1942); shifted to radars 10/44; part of NPO 'Leninets'
279*	Panel'	Leningrad, now St Petersburg	instruments; separated from Teplokontrol Trust 8/39; under construction in 1940 but may never have opened
279		Balashikha and Ramenskoe, Moscow obl.	aircraft components; had two sites, in Ramenskoe and Balashikha; p/ya 1408 (1940); evacuated Izhevsk on site of Club im. 10 Let Oktyabrya 11/41; later reopened 2/42; hydraulic equipment by 1958
280*		Ul'yanovsk	under construction as aircraft instrument plant when it absorbed zavod 278 which had been evacuated from Leningrad and it also accommodated evacuated Moscow Institutes, e.g. NII-12; p/ya 99 (1942)
280	Opytnyi zavod	Ramenskoe, Moscow obl.	aircraft instruments, formed 1939; now AO 'Ramenskii Priborostroitel'nyi zavod'
281		Kuibyshev, now Samara	aircraft components; under construction in 1941; reference to OKB-281 in 1957
282	Aremz	Ufa	car repair plant transferred in 1941 to NKAP to produce radiators as a twin for 266; taken over by evacuated Moscow zavod 161 or 26 11/42 which retained its number
283		Ul'yanovsk	under construction as aircraft aeroengine component plant, twinned with zavod 20; it accommodated evacuated Moscow zavod 25 and lost its number 11/41
284			evacuated to Ufa and absorbed by zavod 384
285		Ul'yanovsk	aircraft armament; twin of zavod 34; transferred to Gor'kii 4/41
286		Kamensk-Ural'skii, Chelyabinsk	aircraft components and undercarriages; twin of zavod 120, under construction in 1940; received part of zavody 219 and 120 from Balashikha; p/ya 30 (1942); absorbed zavod 120

	obl.	11/45	
287	Vladimir	accurate castings for aircraft instruments; under construction in 1940-2; p/ya 11 (1942)	
287*	Leningrad, now St Petersburg	former Lentextilemash; under construction 10/41; radars since 10/44; acquired German resources of Wernerwerke (Fustemberg) and Radiowerke (Vienna) in 1946; accommodated OKB-287 from 4/46	
288	Savelovo, Kimry, Moscow obl.	former 'Savelovskii mekhanicheskii z-d' transferred to PGU NKOP in 1938 to prepare for production of Martin flyingboat as a second site for z-d 30, numbered 288 4/3/40; from 3/40 to 4/41 housed OKB z-da 288 of Samsonov transferred from Ivan'kovo/Podberez'e site of z-d 30 to support serial production of MDR-7 and Beriev design bureau (TsKBMS) itself transferred from z-d 31 2-3/41 to support serial production of Be-4; OKBs evacuated first to Chkalovsk, Gor'kii obl. 16/10/41 then Kolomzino, Omsk obl. 12/41 together with z-d 288; transferred to ARZ 477 im. Pobezhilova, Krasnoyarsk 5/5/43; in 1943 site received z-d 2 'Orgaviaprom' returning from evacuation in Chebarkul', Chelyabinsk obl.; renumbered z-d 491 6/44	
289	Podlipki, now Korolev, Moscow obl.	opytnyi zavod; housed OKB Shcherbakov, Silvanskii, KB-29 and later Sukhoi OKB when it was transferred from Khar'kov in 1940; evacuated and absorbed by zavod 19, Molotov 11/41 or to a site in Molotov obl. retaining its independence and number; Podlipki site used as repair plant 390 (or 380?) from 6/42	
290	Ukhtomka, Lyubertsy, Moscow obl.	helicopters; separated from zavod 156 and hosted OKB Kamov in 1940; p/ya 144 (1940); evacuated Bilimbai, Sverdlovsk obl. onto site of zavod 468 10/41, absorbed it but dissolved in 1943; Ukhtomka site reopened 1948 as zavod 938; now AO 'Kamov'	
291	Moscow (Tushino)	aeroengine parts, evacuated Ufa onto sites of a school and a saw mill 10/41; preserved independence till 3/42 then returned to Moscow and absorbed by zavod 45; Moscow site transferred to zavod 453 and hosted zavod 261 to repair burnt aircraft; transferred to Orgaviaprom 5/43 and became filial zavod 165	
292	Sarkombain	Saratov	former farm machinery plant having an aircraft shop which produced the I-7, converted 2/38 to aircraft factory building the R-10 and then from 1940 the Yak-1; later became a filial of zavod 115; absorbed evacuated zavod 165; p/ya 1 (1942-4); received resources of Gustlowwerke (Kal); now AO 'Saratovskii aviatsionnyi zavod'
293	Moscow (Khimki)	experimental factory separated from zavod 84, housed several OKBs; evacuated Bilimbai, Sverdlovsk obl. 10/41; in 1944 reopened in Khimki as filial NII-1; from 6/46 again zavod 293 for Bisnovat; rocket aircraft, later guided missiles and ramjets	
294	Moscow (Sokol)	formed on a construction site and transferred to NKAP in D18110/40 to produce airframe parts from 'plastic wood'; OKB added 2/41 but on evacuation to Kazan' in 10/41 absorbed by zavod 22 as its filial, still making 'plastic wood' components';	

			Moscow site became zavod 480 12/41 and on 16/3/42 given to OKB-MiG as zavod 155
295		Kuibyshev (Bezymyanka), now Samara	lost its number when absorbed before completion by zavod 122, itself absorbed shortly after by evacuated zavod 18
296	im. Dzerzhinskogo (FED)	Khar'kov, Ukraine	formed on the base of the 'FED' plant; aeroengine components, hosted OKB-296; p/ya 711 (1940); evacuated 1941 to Berdsk, Novosibirsk obl. onto site of a warehouse; Khar'kov site became repair shop 11/43 and rebuilt 1944 when returned from evacuation
301		Moscow (Khimki)	converted to aircraft factory in 6/37 and built UT-2 and UT-3 trainers and later Yak-1 and Yak-7 fighters; evacuated 10/41 into zavod 153 Novosibirsk; Khimki site used for repairs and assembly; Lavochkin OKB at zavod 301 evacuated to zavod 21, Gorkii and returned 12/45; Khimki site rebuilt and reopened 4/42 again as zavod 301; acquired resources from Arado (Ratunau) in 1946; later built missiles/spacecraft, now 'NPO im. S.A.Lavochkina'
305		Moscow	tools for aircraft industry, built 1937-39, evacuated 10/41 to Kuibyshev onto site under construction
306		Saratov	aeroengine components - magnetos and spark-plugs, transferred from NKSM to NKAP in 1939; whilst under construction received evacuated zavody 456, 133, 307 (for short period of time), and part of 161; reported to be also building naval vessels 1941; p/ya 105 (1942); received resources from Bosch (Wansee) in 1946
306bis		Saratov	under construction; aeroengine components
307		Rzhev	former zavod 7; guns components; numbered 12/36 as part of NKOP later transferred to NKAP
307bis		Rzhev	aeroengine components and engine washer plant under construction; p/ya 23 (1940); evacuated to Saratov 10/41 and absorbed by zavod 306 but separated as independent zavod again 1/42 and then transferred to Ufa as filial zavod 307; received workers of zavod 497 (Kemerovo)
315		Kirov	aircraft armament components; received zavod 32 evacuated from Moscow 10/41 and absorbed by it
324		Kirovo-Chepetsk, Kirov obl.	opened 1941; avionics factory; rebuilt and relaunched 20/4/72 for aerospace equipment; now OAO 'Velkont'
326		Moscow (Fili)	N.Polikarpov developed aircraft D (SPB) here
328		Vladimir	metal and plastic castings for avionics, numbered from 1939; evacuated 1941 and absorbed by zavod 287; construction continued
328		Nikolaev, Ukraine	aircraft repairs

329	Komso- mol'sk na Amure	avionics plant; under construction till 1942
333	Komso- mol'sk na Amure	numbered from 1939; aeroengines; under construction till 1941
334	Irkutsk	aeroengine plant; building started 1939
335	Novosibirsk	construction stopped in 1941; transferred to NKtankprom together with zavod 381 3/43; transferred to NKSM 8/45 but in 10/45 being rebuilt as lorry plant and then again before completion converted for 'nuclear work' as zavod 250
336	Saratov	aeroengines; under construction in 1940
337	Syzran, Kuibyshev obl., now Samara obl.	aeroengines, built 1939 but in 10/41 absorbed part of evacuated zavod 181 of NKSP; site taken over by evacuated zavod 24 (which also absorbed zavod 377?)
337bis	Kuibyshev, now Samara	aeroengines; under construction in 1940
338	Ufa	M-105 aeroengines; under construction in 1940; together with zavod 234 and 451 absorbed by zavod 384 8/41 or 10/41
339	Molotov, now Perm'	aeroengine components eg carburettors; received and absorbed zavody 33, 25 from Moscow and 462 from Dnepropetrovsk 10/41; p/ya 3 (1941) and then zavod 339 renumbered zavod 33
358	Vladimir	avionics, numbered from 1939; evacuated in 1941 and absorbed by zavod 287
365	Kaunas, Lithuania	former Gustaitis plant, which built 'Anbo' aircraft, acquired by NKAP 1940 to build copy of Fiesler Storch to be called OKA-38 Aist of which only a few were built before factory was overrun by the Wehrmacht
374	Kazan'	a filial of this plant on the same site became zavod 708 of NKSP in 1942
377	Kuibyshev, now Samara	under construction 10/41 when absorbed by evacuated zavod 24 from Moscow (another source suggests zavod 24 absorbed zavod 337 at Kuibyshev - perhaps both were absorbed?)
377bis	st. Kui- byshevka, Novo- kievskii Uval, Amurskaya obl.	avionics repair plant opened 1939
378	Kursk	batteries; numbered 1/38
380	Leningrad, now St Petersburg	converted to aircraft in 1940; housed OKB of O. Antonov since 10/40 till 3/41; produced one Il-2 before evacuated to zavod 183 Nizhnii Tagil' and absorbed by zavod 381 in 7/41; site later reopened and by 1958 was telemetry equipment plant

381	Izhora, Leningrad obl.	'Lenmetallurgstroï' factory converted 1940 for aircraft production (produced components for one Il-2 assembled at zavod 380 in Leningrad), p/ya 240 in 1941; evacuated 7/41 to Nizhnii Tagil' taking over site of zavod 183 NKSP and also absorbing zavod 380; transferred to Moscow (Khodynka) 4/43 to produce La-5 and later La-7 fighters but absorbed by zavod 30 in 1949; Izhora site given to zavod 496 in 5/44
382	Tartu, Estonya	avionics plant opened 11/40; evacuated 1941 mostly to Kuibyshev, where it lost its number when absorbed by zavod 122, and partly to Vladimir; Tartu site became zavod 89 in 11/44
383	Leningrad, now St Petersburg	former SNK building plant converted 1941 to NKAP propeller and ski factory; evacuated 10/41 to Yoshkar-Ola
384	Ufa	former 'Ufinskii Motornyï zavod' car engine plant, acquired 1940 by NKAP from NKSM for M-105 aeroengines; absorbed evacuated zavody 234, 284 and 451 plus parts of zavody 49 and 451; p/ya 20 (1941); itself absorbed by evacuated zavod 26 together with adjacent zavod 338; one source suggests the absorption carried out in 1945
386	Leningrad, now St Petersburg	converted to aviation 1940, evacuated 1941
387	Leningrad, now St Petersburg	formerly zavod 4 'Karakozov' of Osoaviakhim, 1931 to NKAP 9/40, when converted to aircraft, building U-2 trainers; evacuated Kazan' onto site of zavod 169 and absorbed it 7/41; former site in Leningrad together with site of zavod 47 used to form zavod 273
388	Leningrad, now St Petersburg	aircraft compenents and undercarriages; under construction in 1940; evacuated into zavod 153 Novosibirsk 7/41 and absorbed by it
389	Smolensk	aircraft components
400	Khar'kov, Ukraine	acquired by NKAP 1940 to build Pe-2s but evacuated 1941 before production started
444	Moscow	aeroengine components; former Opytnyi zavod selskokhozyastvennogo mashinostroeniya; evacuated to Sim, Chelyabinsk obl. 7/41 and absorbed by zavod 132
446	Baku, Azerbai- dzhan	Pe-2 components; absorbed by evacuated zavody 458 and 466
447	Erevan, Armenia	under construction; intended for Pe-2 components 1941; produced components for zavod 31; aircraft repairs from 1942, but built Be-4 flyingboats and UT-2 trainers in 1944-45
448	Tbilisi, Georgia	intended in 1941 for aeroengines for Pe-2s but absorbed by evacuated zavod 31 in 9/41 together with zavod 45
449	Ukraine	formed 10/40 based on automotive zavod im. Krasina; absorbed by zavod 167 when evacuated to Saratov 1941

450		Khar'kov, Ukraine	former automotive repair plant; intended for Pe-2 production; p/ya 980 (1940); evacuated to Kuibyshev before being opened; equipment from here used later to help restart zavod 1 and other plants; Khar'kov site transferred to VVS 7/45
451		Leningrad, now St Petersburg	aeroengines; evacuated Ufa 7/42 onto site of zavod 384 and absorbed by zavoda 26; Leningrad site housed a filial zavoda 451 in 1944-45
451 filial		Moscow	aeroengine components; formed 11/40 based on optical-mechanical plant 1 of Osoavikhim; evacuated Ufa onto site of zavod 384 and absorbed together with zavody 234, 338, 384, and 451
452		Dnepro- petrovsk, Ukraine	aeroengines, under construction 6/41; partly evacuated to Moscow onto site of zavod 24 and then to Kuibyshev onto site of zavod 337 10/10/41 when partly dissolved; zavod 486 formed on Dnepropetrovsk site in 1942
453		Minsk, Belorussia	aircraft; under construction since 1940; intended to be zavod 383 but redesignated in 11/40; evacuated to Kuibyshev 7/41 onto site of zavod 122 and absorbed by zavod 1; part of its equipment transferred to other plants; Minsk aircraft plant never completed as such but rebuilt in 9/44 as a repair shop which also assembled fighters; construction site transferred to NKSM in 11/45 and received resources from Heinkel (Oranienbaum) with the intention of building bombers but this plan abandoned and the Minsk avtozavod (MAZ) completed c.1950 to build trucks
454		Kiev, Ukraine	aircraft components; p/ya 8 (1941); evacuated to Kuibyshev onto site of Khod cooperative in 7/41 and launched at this new site in 8/41; Kiev site used for repair shop from 1/44 and in 1/45 zavod 483 (later zavod 'Radar') formed there
454bis		Kuibyshev, now Samara	aircraft armament; received part of zavod 487 in 1941
455	im. Artema	Kiev, Ukraine	chemical and aircraft armament components, under construction 6/41; p/ya 406 (1941); partly evacuated to Bezymyanka, Kuibyshev obl. where building site was under construction and partly destroyed 7/41; absorbed by zavod 145 in 1/42; factory used as repair plant from 1/44
456		Poltava, Ukraine	former textile machinery plant converted to make aeroengine components and bombs; evacuated onto site of zavod 306 Saratov in 8/41 and absorbed together with zavod 133; Poltava site used as repair shop from 11/43 when it became zavod 488
457		Zaporozh'e, Ukraine	aeroengine parts and undercarriages; p/ya 10 (1941); evacuated 7/41 absorbed by zavod 464 9/42; restored 1943; received resources Arado (Freiberg) and wings and launching devices for V-1 from Spek 1946
458		Rostov na Donu	former 'GAZ im Uritskogo', converted to build UTI-4 trainers in 1941 and evacuated to Baku later in the year; Rostov site acquired zavod 87 4/43
459		Mogilev, Belorussia	formed in 1940 as zavod 382; renumbered 11/40; partly evacuated Kuibyshev and absorbed by zavod 24 together with

		Belorussia	evacuated Kuibyshev and absorbed by zavod 24 together with zavod 337 and lost its number
461		Kirov	aeroengine components and instruments; former zavod KUSHTO; p/ya 210 (1941); received evacuated zavody 266 and 476 and lost its number
462		Dnepropetrovsk, Ukraine	aeroengine components; p/ya 210 (1941); evacuated to Molotov (Perm) and absorbed by zavod 19 losing its number; repair plants formed on original site 11/43
463		Tallinn, Estonia	new plant 1940 planned for LaGG-3 production; ordered to produce 11-seat glider designed by Tsybin and Kolesnikov 4/41; evacuated Kuibyshev and absorbed by zavod 122 which later became part of zavod 1; part of equipment delivered to other plants
464		Riga, Latvia	new plant 1940 formed in garage and in the Provodnik plant to produce U-2 and Yak-6; evacuated to Kuibyshev onto site of zavod 122 6/41 and absorbed by zavod 1 in 10/41; part of equipment delivered to other plants; its garage transferred to NKSM and transmitter to NKEP 11/45
465		Kaunas, Lithuania	former repair plant of Lithuanian Airforce; transferred to NKAP and numbered in 1940; evacuated to Kuibyshev in 7/41 onto site of zavod 122 and absorbed by zavod 1; part of its equipment transferred to other plants; reopened in Kaunas as a repair plant in 1944
466	Krasnyi Oktyabr'	Leningrad, now St Petersburg	converted to aeroengines and numbered in 2/41; evacuated to Gor'kii 7/41 into engine shop of GAZ, returned 1945 onto site of zavod 274; received resources from Germany 1946; now AO 'Krasnyi Oktyabr'
467		Pavlovo na Oke, Gor'kii obl., now Nizhnii Novgorod obl.	propellers 1944; p/ya 50 (1942); by 1958 hydraulic suppressors and control systems.
468		Moscow	airborne forces equipment; formed 11/40 in Beskudnikovo, Moscow for KB Privalov; evacuated Bilimbai 11/41 and absorbed zavody 290 and 293; returned to site of filial zavoda 468 5/43; again housed group of Privalov 3/46
468 filial		Moscow (Beskudnikovo)	gliders; formed on original site of evacuated zavod which returned 5/43 as zavod 468 when this filial was decommissioned
469	im. Gromova	Solnechnogorsk, Moscow obl.	radiators; p/ya 2 (1941); evacuated Gor'kii onto site of zavoda 285 and absorbed it 10/41; site also used for zavod 459 or 489 2/42
470		Vilnius, Lithuania	radio; former Radiozavod; formed 12/40, numbered 2/41; dissolved 7/41; site became zavod 555
470*		Leningrad, now St Petersburg	aircraft instruments, evacuated Molotov 7/41; returned to site of zavod 379 11/44 and changed to nav aids, weapons systems and simulators; OKB and prototype plant formed 1946 to

		develop simulators; now NPO 'Elektroavtomatika'
471	Shumerlya, Chuvashiya	by 1942 produced Yak-6 aircraft later U-2s and assault gliders; received OKB-48 (Gribovskii), propeller shop of zavod 168, and OKB-31; p/ya 320 (1942); transferred to NKL 7/45
472	Bolshevo, Moscow obl.	aeroengine components, radiators, munitions; p/ya 91 (1941); 10/41 evacuated to zavod 34bis, Kuznetsk, Penza obl. and onto site of the rope plant of Molot cooperative; Moscow site became filial zavoda 145 4/42
472*	Kozlovka, Chuvashiya	assault gliders; evacuated 1941 to Penza and Kuznetsk
473	L'vov, Ukraine	formed 12/40 and number lost in 1941; partly evacuated to Kazan' onto site of zavod 448 and absorbed together with filial zavoda 218; L'vov site became zavod 87 in 11/44
474	Moscow	instruments; former musical instrument plant transferred to NKAP 1940; p/ya 1408 (1941); evacuated onto Sverdlovsk on site of electro-mechanical college 10/41; at first a filial zavoda 474 and then zavod 474 itself
475	Moscow	radios; formed on basis of Krasnyi futlyarshchik 4/41; evacuated onto site of zavod 461 Kirov 1942 and absorbed together with zavod 461 by zavod 266; zavod 299 formed on Moscow site in 1943
476	Moscow	instruments; former plant for calculators and analytical machines im. Dzerzhinskogo; evacuated to Kirov and absorbed by zavod 461; alternative version: evacuated to Kirov onto site of zavod 461 and absorbed there by zavod 266 in 11/41; restored 4/42 to produce aeroengine fuses; p/ya 2413 (1942); transferred to site 2 of zavod 315 8/45; site accommodated zavod 25 to produce electric parts for armament of B-4 (Tu-4); received resources of Askaniawerke (Berlin); housed OKB-476; had filial at zavod 266; transferred to MRTP later
477	Laptevo, Tula obl.	spare parts; formed in 1941; p/ya 1 (1941); evacuated Krasnoyarsk onto site of former zavod im. Pobezhimova 10/41
478	Kaluga, Moscow obl.	aircraft plant still under construction when evacuated either to Chkalov to be absorbed by zavod 47 or to Tashkent to be absorbed by zavod 84
479	Serpukhov, Moscow obl.	instruments; p/ya 102 in 1941; evacuated to Biisk, Altai area, onto site of automotive repair plant 11/41
480	Khar'kov, Ukraine	aviation products
481	Dnepro- petrovsk, Ukraine	aircraft armament; evacuated Syzran onto site of zavod 164 and absorbed it in 7/41
481 filial	Moscow	formed in 1941; became zavod 487 2/43

482	Moscow (Khodynka)	formed 24/3/41; high-altitude aircraft research; OKB of Shcherbakov, experimental factory and repair plant housed on site of zavod 133 in Vladykino; OKB evacuated to Kazan' 1941 or Kozlovka, Chavashiya and absorbed by zavod 494; Moscow site used as repair plant until OKB returned in 1942; p/ya 2227 (1942); equipment from zavod 482 which was housed at zavod 133 transferred to zavod 89 then redesignated zavod 482 as the prototype plant of V. Myasishchev; zavod 482 itself absorbed by OKB-240 on 20/2/1946; site in Vladykino transferred to NII-1 1946
483	Kiev, Ukraine	opened 2/41 as opytnyi zavod for OKB Tairova on site of zavod 43; evacuated Kuibyshev 7/41; Kiev site reopened for aircraft repairs 1943, but original factory returned in 1944; transferred to radar in 17 GU during 1/45, incorporating zavod 454; OKB formed 1949 for radar equipment and bombsights which later became NII Kvant
484	Verkhniy Nevyansk, Novoural'sk, Sverdlovsk obl.	rolled aluminium plant under construction when it received evacuated zavod 261 in 1941 and was absorbed; produced undercarriages; construction completed 7/45 but transferred to work in nuclear industry as kombinat 813; received resources from Durenermetalwerke (Berlin) 1946
485	Kremenchug, Ukraine	rolled aluminum plant
486	Orel	rolled aluminum-magnesium alloys
487	im. KPG Moscow	aircraft armament; former filial zavod im. KPG NKOM; housed OKB Shebanov in 1940; evacuated to Syzran (75%) onto site of zavod 481 and also to Kuibyshev (25%) onto site of zavod 454 and lost its number
487*	Zaporozh'e, Ukraine	aviation products; evacuated to Kuibyshev 11/41 onto site of zavod 454bis and absorbed
488	Rostokino, Moscow obl.	sharashka for aviation products, opened 1940 as overspill for zavod 156, closed 1951; 1944 filial opened in Poltava to rebuild damaged US bombers for Soviet use
489	Kazan'	aeroengines; removed from list of NKAP plants 5/42
490	Stalingrad, now Volgograd	gliders; p/ya 50 (1942); OKB Kurbala; destroyed during bombardment and lost its number; site used to form repair plant 3/43 and later zavod 86 in 4/43; transferred to NKSM 8/45 to assist Dnepropetrovsk automotive plant
490*	Dnepropetrovsk, Ukraine	instruments; formed on site of former plant im. Petrovskogo; not evacuated; restored 1944; transferred to NKSM 8/45
491	Verkhnyaya Salda, Sverdlovsk obl.	under construction in 1941 as 'Stalmost' when absorbed by evacuated zavod 95 from Setun', Kuntsevo, Moscow obl. and lost its number
492	Engel's and Orenburg	noted as a future production plant for Yak-1 fighters; not opened because zavod 47 absorbed the Orenburg site 7/41
493	Sverdlovsk,	aircraft materials; under construction when a part was absorbed

	now Ekaterinburg	by zavod 28 from Moscow 11/41; rest transferred to Alapaevsk
494	Kozlovka, Chuvashiya	assault gliders and U-2 aircraft; absorbed zavod 482 3/41; received part of zavod 168; p/ya 160 (1942); noted on civil work in 1945
495	Omsk	farm machinery plant planned for conversion to aeroengine components; absorbed by evacuated zavod 20 from Moscow
496	Izhora, Leningrad obl.	castings; formed in 1940 on site of repair shop of NKPS in 1940 and in 5/44 received part of the site of evacuated zavod 381; p/ya 240 (1942-4); transferred to NKUgol 4/45
600	Urumchi (China)	assembled I-16 fighters and UTI-4 trainers from parts supplied from USSR; opened 9/40, closed 8/41

Much of the data in the above table was taken from 'The numbered factories and other establishments of the Soviet defence industry Part1 Factories and shipyards: a numbered list (version 3.0)' by Julian Cooper, Keith Dexter, Mark Harrison and Ivan Rodionov on the authors' website:

<http://www.warwick.ac.uk/economics/harrison/vpk/>

Aircraft Production 1918-45

Taken from 'Samoletostroenie b SSSR (1917)' edited by G.S.Byushgens

Year	Aircraft Built	Year	Aircraft Built
1918	225	1932	2509
1919	237	1933	4115
1920	166	1934	4455
1921 economic year	67	1935	2529
1922 economic year	44	1936	4270
1923 economic year	186	1937	6039
1924 economic year	327	1938	7727
1925 economic year	339	1939	9897
1926 economic year	352	1940	10540
1927 economic year	545	1941	15735
1928 economic year	608	1942	25436
1929	912	1943	34886
1930	1149	1944	14024
1931	1489	1945	26479

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'Rodionov's Chronology' a detailed review of Soviet aviation 1917-46, based mostly on archival sources, can be found on website:

<http://www.warwick.ac.uk/economics/harrison/aviaprom/>