

# **The numbered factories and other establishments of the Soviet defence industry, 1927–67: a guide**

## **Part I. Factories and shipyards**

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## Preface

It is many years since the first information about the secret ‘numbered’ zavody (factories) of the Soviet defence industry began to seep into the public domain. However, a real opportunity to begin to compile a relatively authoritative and comprehensive list awaited the opening of former Soviet archives after 1991.

This is Part I of our project. It deals with production establishments — factories and shipyards — of the defence industry narrowly defined. It excludes the design and scientific establishments of the defence industry, though design bureaux directly subordinated to factories are mentioned in passing in the present list. Part II will deal with numbered design bureaux and research institutes. The present work also excludes the aircraft and ship repair establishments maintained directly by the armed forces.

Our work provides a new resource for scholarly research on the Soviet defence industry. We anticipate that it may be used in different ways, most obviously two. First, it provides a new context for historical case study and anecdote. Thus, the historian who stumbles across mention of factory no. 22 may now read that this aircraft producer began its existence as an automobile works, established during World War I as the ‘Russko–Baltiiskii zavod’ in the Fili suburb of Moscow; in the 1920s it was renamed State Automobile Factory (GAZ) no. 2 and ‘1–i BTAZ’ of the automobile industry; converted to aircraft, it became State Aircraft Factory (GAZ) no. 7; in 1927 it was renumbered as *zavod* no. 22; it was also known from this time as the ‘Ten years [after the] October [Revolution]’ plant, and was at some point also named after S.P. Gorbunov; in 1941 it was evacuated to Kazan’ where it remained after the war. Factory no. 22 was twice the beneficiary of German aviation technology, once in the 1920s as the result of a collaborative agreement with the Junkers company, and again in 1946 when it absorbed part of the former Heinkel factory from Elsnitz in the Soviet occupation zone of postwar Germany. Factory no. 22 still exists today as KAPO, the Kazan’ Aviation Production Association, still named after Gorbunov.

Second, the present work provides the basis for new perspectives on the scale and diversity of military–industrial production in the Soviet economy. For example, it may be used to analyse such issues as the changing number of specialised Soviet defence producers, their varying ministerial affiliations, their concentration in particular cities and regions, their changing product assortment, and the short–term impact and long–term consequences of the evacuation of defence producers into the interior of

the country in 1941–2. For purposes of computer analysis an electronic version of the list may be more useful than the printed page, and can be downloaded freely in various formats from our website: <http://www.warwick.ac.uk/staff/Mark.Harrison/VPK/>.

At the present moment, the list is in the form of a table of 789 rows and 9 columns. In Microsoft Excel version 5.0 format, each row of the list is fully independent of all other rows. Thus the list may be not only searched and filtered, but also sorted by selected criteria with safety. Each row represents a separate factory number and location. The rows begin with *zavod* no. 1 and proceed in order to the highest number used which was apparently *zavod* no. 1127. There are many gaps in the sequence; above 770 the representation of factory numbers in our database is particularly sparse. Is this because the Soviet authorities did not number enterprises on a

continuous scale and left many sequences of numbers unused, or because our database is spectacularly incomplete in the higher numbers? We believe the former. Thus the 789 rows give a lower bound on, but also a first approximation to the total number of Soviet defence production establishments existing separately through space and time. However, because the same numbers were used for more than one place (e.g. when a factory was evacuated but retained its number) or for more than one discrete period of time (e.g. when a factory's former number was reallocated to another), the total of factory numbers actually utilised which we have been able to trace is not 789 but a smaller number — 607 — within the 1 to 1127 range.

The columns of the table represent the 9 criteria which we ourselves have selected. These criteria are defined as follows:

1. No.	The factory number.
2. Name	The factory name, where given, during the period under investigation; factory names from the pre-Soviet period, the 1920s, or the present day are given under "Other details".
3. Location	The town or city (occasionally, the oblast' or other territorial division). Where the town is obscure, the oblast' is also given, where known, in brackets. In the case of the city of Moscow the suburb is also given, where known, in brackets. Where the city's present-day name has been changed from the Soviet period, both names are given if possible.
4. Subsidiary units	The existence of design bureaux and institutes housed by or directly subordinated to the factory, and of filial factories, is indicated where known. Names of some of the most important design bureau chiefs in the aircraft and missile industries are given under "Other details". More comprehensive coverage awaits Part II.
5. Branch	The main branch of defence production with which the factory was identified is coded as follows: AERO      Aerospace (aircraft, missiles, and space) ARMOUR    Armoured vehicles ARMS      Armament (artillery and infantry armament) ATOM      Atomic weapons ELEC      Electronics and the radio industry FUEL      Liquid fuels MUNS      Munitions (ammunition, explosives, and chemical agents) SHIP      Shipbuilding OTHER     Other or not known
6. Ministry	The responsible government department, usually VSNKh (until 1932), or subsequently the relevant people's commissariat (1932–46) or ministry (1946–91). Dates given under this heading are those of the relevant documentary evidence.
7. Other details	Under this heading are given more specific detail of the factory's production profile, previous and present-day factory names, details of wartime evacuation, and other changes of status.

8. Date	The period over which the existence of the factory under the given number and at the given location is confirmed by documentary evidence.
9. Source	The documentary evidence, discussed further below.

We are aware that, had this work been presented before the Gorbachev years, some in the USSR would then have regarded it as a provocative attempt to undermine Soviet national security. Fortunately we now live in more relaxed times. The Russian defence industry has opened up to a remarkable extent (as illustrated by appearance of the multi-volume *Russia's Arms Catalog — Oruzhie Rossii: katalog*, published by the Russian 'Military Parade' company. A wealth of material on the history of the Soviet defence industry is now available in the Russian archives; a landmark in the use of this new material by Russian scholars was the publication in 1996 of Nikolai Simonov's *Voенно–promyshlennyi kompleks SSSR v 1920–1950–e gody [The military–industry complex of the USSR from the 1920s to the 1950s]*.

Official documents of Soviet agencies directly concerned with the defence industry at various moments in Soviet history are the most reliable of our source materials and provide the core of the present work. Russian archives are today in transition from a state in which secrecy was normal to one of relative openness. Such a transition can be difficult and painful, just like the many other transitions which Russia is undergoing today. This applies in particular to defence-related fields, even where the issues concerned are purely historical. Many relevant documents have been entirely declassified and are accessible to anyone. Others may be studied but not cited, cited but not quoted, or quoted but not identified. This explains the lack of uniformity in the style of references to different documents.

Moreover, the official documents so far made available for scholarly research do not provide either comprehensiveness or continuity. Therefore they still require supplementation from a wide range of secondary sources — memoirs, histories, the intelligence files of other countries, and journalistic contributions. Not all such sources are equally reliable. It may help the reader to note that our source materials are coded alphanumerically, and that Soviet official documents, the most reliable of all, are coded with the letter 'A'. Also considered generally reliable are the publications of Russian scholars (such as Simonov) based on archive materials. Less dependable are the available reports of Western intelligence agencies, in particular the German reports of the 1930s and war years which have been the source of much information presented to date in western publications devoted to Soviet military technology. We hope our work will stimulate further research, and perhaps also a more comprehensive

approach to the declassification and publication of the relevant historical documents held in the Russian state archives.

We welcome comments and corrections. We propose that the appropriate form is an email message addressed to: [Mark.Harrison@warwick.ac.uk](mailto:Mark.Harrison@warwick.ac.uk). One way to generate such a message is provided on our website. If the need becomes pressing, and as time permits, we will amend the list in the light of comments and information received. Additional information will be greatly appreciated, but must be fully referenced if it is to be incorporated into future editions. The present list is numbered version 1.0. Later versions will be numbered sequentially. However, we do not propose to update the list frequently. In the interim, we propose to post all correspondence received to our website in the order of its receipt. We will assume that all correspondents give us permission to publish their communications in this way unless such permission is explicitly denied. Thus, all comments and criticisms will be made available to all interested scholars.

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The authors alone are responsible for all the errors of fact, interpretation, and omission which are sure to be present in a work of this nature.

## Introduction

by Julian Cooper

From the earliest years of the USSR it became the practice to identify organisations engaged in military–related activities by the use of numbers. Numbering systems for industrial enterprises were introduced soon after 1917. At a time when factories were still known by their prerevolutionary company names, this appears to have been as much a matter of convenience as a question of concealment for security reasons. By the late 1920s, however, security considerations came to the fore and the numbering system was used deliberately to conceal the identity of factories engaged in military production, and also research and design organisations.

During the 1930s and, dramatically, in the years of the war, the number of facilities covered by the numbering system expanded rapidly. In the postwar years the system was retained, although with some modification as ‘post–box’ numbers were adopted. The security regime was further reinforced by concealment of the location of ‘closed’ towns and settlements considered to be of military importance by the use of yet another numbering system. Only towards the end of the Soviet system was there some relaxation of the numbering system, with the increasing identification of organisations of the defence industry by open use of official names of enterprises and R&D organisations. This process of dismantling the Soviet regime of secrecy has continued in post–communist Russia, although at the time of writing the numbering system has still not disappeared completely.

With the nationalisation of factories of the aviation industry during the Civil War, a system of numbering was introduced, State Aviation Factory (GAZ — *gosudarstvennyi aviatsionnyi zavod*) no. 1 being the former ‘Duks’ works in Moscow (see table 1). At about the same time some factories of the motor industry were also given numerical identities. The Moscow ‘AMO’ works (later ‘ZIL’) also and confusingly became GAZ (*gosudarstvennyi avtomobil’nyi zavod*) no. 1; the Moscow ‘Russko–Baltiiskii zavod’ became GAZ (automobiles) no. 2; eventually it was converted to aircraft production becoming GAZ (aircraft) no. 7); and so on.

With heightened concern for defence in 1927 the existing enterprises of the ‘core’ defence industry were given the numbers 1 to 56.<sup>1</sup> In connection with

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<sup>1</sup> Simonov, N.S. (1996), *Voенно–promyshlennyi kompleks SSSR v 1920–1950–e gody: tempy ekonomicheskogo rosta, struktura, organizatsii proizvodstva i upravlenie*, ROSSPEN, Moscow, p. 36

this development the numbering system used in the aircraft industry was changed. Only GAZ no. 1 was retained; the other factories received new numbers although in many cases the change was superficial: 3 became 23, 4 became 24, etc. This development can be considered the true beginning of the numbering system employed in the Soviet defence industry.

However, it took some time to establish a single national system. After 1927 some enterprises were occasionally referred to by old numbers and there were individual cases of duplication, e.g. a decree of July 1934 on factories of the military industry refers to two *zavody* nos 19, one in the aviation industry (Perm' aeroengine works normally identified as no. 19), the other in shipbuilding.<sup>2</sup> With the formation of the People's Commissariat of Heavy Industry (NKTP) in 1932, responsible for most enterprises fulfilling military orders, a single national system was consolidated and appears to have been almost fully developed by the end of 1936 when the People's Commissariat for the Defence Industry was established. But even then there were inconsistencies, e.g. in the official list of NKTP organisations subject to transfer to NKOP in a decree of SNK SSSR dated 21 December 1936, the famous Tula gun factory (TOZ) was identified as no. 1 in addition to the Moscow no. 1 'imeni Aviakhima' of the aviation industry, but this may have been a simple error arising from the fact that TOZ, the oldest arms factory of Russia, sometimes appeared first in listings of enterprises.<sup>3</sup> During the 1930s the number of enterprises covered by the numbering system steadily increased. However, some very well-known factories, concealment of which probably served no purpose, retained their names and at least during the prewar years do not appear to have ever been given numerical designations, for example the Leningrad Kirov factory (LKZ).

In the late 1930s, as many formerly civilian enterprises were given orders for military work, they were incorporated into the system of numbered factories in order to increase the level of secrecy. Numbered factories could be mentioned in the press, but without names and locations. Whereas before the war most numbered factories belonged to the commissariats of the defence industry or the closely-related machine-building industry, with the outbreak of war enterprises of other sectors of the economy were drawn into the numbering system, in particular from the metallurgical, chemical, and fuel industries. With the eastward evacuation of enterprises and

<sup>2</sup> Russian State Economics Archive (RGAE), *fond* 7297, *opis'* 38, *delo* 91 (hereafter 7297/38/9), folios 36–67.

<sup>3</sup> RGAE, 7297/38/9, folios 3–6.

R&D organisations the numbering system underwent significant change and became increasingly complex. In many cases the original number accompanied the evacuated facility to its new location, e.g. *zavod* no. 1, the Moscow aviation works 'imeni Aviakhima' (formerly 'Duks') was evacuated to Kuibyshev where the new factory became no. 1 and retained this designation after the war. In such cases the premises left behind, if they continued to undertake military work, or resumed it later, were given a new number. For this reason many enterprises in Moscow and Leningrad, not to speak of Ukraine and other parts of the country subject to occupation, had different numbers after the war from those used in the 1930s.

In the postwar years the numbering system was retained. However, from about the end of the 1940s practice differed in one important respect from that of the prewar and wartime years: the numbers were no longer published openly. For security purposes the traditional system of numeration was supplemented by post-box numbers. Each facility of the defence industry had its own post-box (*pochtovyi yashchik*, abbreviated to *p/ya*) number, or sometimes a subscription-box (*abonentnyi yashchik*, abbreviated to *a/ya*) number, which differed from the official factory or institute number. The logic of the differentiation between *p/ya* and *a/ya* numbers is not clear. Thus the All-Union Electromechanics Scientific Research Institute (VNII elektromekhaniki) of the space industry in Moscow was NII-627, but had the address Moscow, *a/ya* 496; the Southern Machine-building Factory (Yuzhnyi Mashinostroitel'nyi zavod) of the missile industry in Dnepropetrovsk was *zavod* no. 586, but *p/ya* 186, while its design bureau was OKB-586, *p/ya* 203; and the Thermal Technology Institute (Institut teplotekhniki) in Moscow, the lead organisation for solid-fuelled missiles from 1946 to 1967 known as NII-1, was *p/ya* 2227.<sup>4</sup>

This system remained in force until the ministries of the defence industry were reestablished in 1965. At some time between 1965 and 1968, probably 1967, the KGB introduced a new form of post-box number, taking the form of a single letter followed by four numbers. These new numbers were

<sup>4</sup> Chertok, B.E. (1995), *Rakety i lyudi*, Mashinostroenie, Moscow, vol. 1, pp. 171 and 236; vol. 2, p. 396; Centre for Statistics and Science Research (1993), *Nauchnye organizatsii Rossii. Spravochnik*, Moscow, p. 40; *Voенно-istoricheskii zhurnal*, 1995, no. 5, p. 51; *Armeiskii sbornik*, 1994, no. 6, p. 76; *Krasnaya zvezda*, 26 April 1995 and 25 February 1995; *Vooruzhenie. Politika. Konversiya*, 1994, no. 4(7), p. 36.

classified.<sup>5</sup> However, from this time many enterprises and R&D organisations were given new proper names or allowed to use their traditional names. For example, the major design establishment for microelectronics where Henry Firdman worked from 1959 to 1973 underwent several changes of name: at first SKB-2 of the Radioelectronics Scientific Research Institute (NII radioelektroniki), in 1961 it became the independent KB-2 (*a/ya* 155); after 1965 it adopted the open name Leningrad Design Bureau (LKB), but was given a new classified designation '*p/ya* G-4783'.<sup>6</sup> (The LKB later became part of the 'Svetlana' science-production association.) This system remained in force until 1989 when a decision was taken to end the use of post-box numbers and transfer fully to the use of actual names for the identification of facilities of the defence industry.<sup>7</sup> To ease the transition the old designations were kept in use until 1 January 1991.<sup>8</sup> However, especially in the nuclear industry, the old *p/ya* and *a/ya* numbers can still sometimes be found, e.g. *a/ya* 918 refers to the Moscow All-Union Automatics Scientific Research Institute (VNII avtomatiki imeni N.L.Dukhova),<sup>9</sup> and *a/ya* 369 to the Moscow Scientific Research Institute for Inorganic Materials (NII neorganicheskikh materialov imeni A.A. Bochvara), formerly NII-9.<sup>10</sup>

It is not clear which organisation had responsibility for the allocation of numbers. There seems little doubt that in the postwar period the KGB (or its equivalent) had overall responsibility for the post-box number system. During the 1930s and the war, however, it is possible that USSR Gosplan, responsible for the allocation of military orders, also controlled the allocation of numbers, perhaps in consultation with the commissariats (ministries) for production, the interior (NKVD), and defence.

The system appears to have been subject to certain rules. Thus it appears that no two enterprises actively engaged in the fulfilment of military orders used the same number at any one time. During the war, blocks of numbers appear to have been allocated to particular commissariats. The use of numbers to identify research institutes and design organisations,

<sup>5</sup> Firdman, H.E. (1984), *Decision-making in the Soviet microelectronics industry. The Leningrad Design bureau: a case study*, Delphic Associates, Falls Church, VA, pp. 13, 37.

<sup>6</sup> Firdman (1984), pp. 21-37.

<sup>7</sup> *Izvestiya*, 28 April 1989.

<sup>8</sup> *Izvestiya*, 21 May 1989.

<sup>9</sup> *Konversiya*, 1994, no. 12, p. 29

<sup>10</sup> *Konversiya*, 1997, no. 5, p. 44; *Voprosy istorii estestvoznaniya i tekhnika*, 1996, no. 2, p. 90

however, appears to have been less tightly controlled, giving rise to some duplication. In particular, this seems to have been the case during the second half of the 1940s and early 1950s, when major defence programmes, especially nuclear weapons and air defence systems, were led by new main administrations specially created under and responsible directly to the Council of Ministers itself, for example the First Main Administration (*pervoe glavnoe upravlenie pri Sovete Ministrov SSSR*, abbreviated to PGU) for nuclear weapons; the Second (*vtoroe glavnoe upravlenie* — VTU) for uranium mining; and the Third (*tret'ee glavnoe upravlenie* — TGU) for the creation of the Moscow air defence system). These new administrations, shrouded in secrecy, appear to some extent to have adopted their own internal systems of numbering for subordinate R&D organisations, but it is possible that some of the apparent inconsistencies arise from the fact that they incorporated organisations of the NKVD-MVD (Ministry of Internal Affairs), involving the use of convict labourers.

From the 1930s, if not earlier, the Soviet internal security service had its own system of numbered factories, R&D organisations, and construction sites using prison labour. At times NKVD design organisations (OKB — *osoboe konstruktorskoe byuro*, and SKB — *spetsial'noe KB*) were attached to enterprises of the defence industry, e.g. in the ship building industry in the 1930s and the war OKBs of the NKVD were attached to a number of factories such as *zavod* no. 340 at Zelenodol'sk.<sup>11</sup> In the 1940s and early 1950s many facilities of the nuclear industry began their existence in the hands of the MVD, numbered according to the Ministry's own system. Thus 'ITL (*ispravitel'no-trudovaya lager'* — corrective-labour camp) i stroitel'stvo no. 817 MVD' was the first industrial reactor for plutonium at a location later known as Chelyabinsk-40, then Chelyabinsk-65 (now Ozersk) and 'ITL i stroitel'stvo no. 880 MVD' was KB-11 for nuclear weapons, located at what during the war was *zavod* no. 550 of the ammunition commissariat (Narkomboepripravov), later known as Arzamas-16 and more recently by its original name, Sarov.<sup>12</sup> Nikolai Simonov is thus probably mistaken in apparently assimilating these numbers to the standard defence-industry system of numbering.<sup>13</sup> The NKVD-MVD also controlled

<sup>11</sup> Shitikov, E.A., Krasnov, V.N., and Balabin, V.V. (1995), *Korablestroenie v SSSR v gody Velikoi Otechestvennoi voiny*, Nauka, Moscow, p. 32.

<sup>12</sup> Kokurin, A., and Petrov, N. (1997), 'MVD: struktura. funktsii, kadry', *Svobodnaya mysl'*, no. 12, p. 104.

<sup>13</sup> Simonov (1996), pp. 216-224

uranium mines with their own distinct system of numbering, e.g. Kombinat no. 6 in Tadzhikistan.<sup>14</sup> Similarly, when the TGU was established to develop the Moscow air defence system it took over the 'Spetsial'noe byuro no. 1 NKVD SSSR' which became KB-1, the leading design organisation of the early 1950s for anti-aircraft missile systems.<sup>15</sup> The missile system itself began life in 1951 as 'ITL i stroitel'stvo no. 565 MVD'.<sup>16</sup>

In addition to facilities of the defence industry and of the NKVD-MVD, at various times some other enterprises were identified by the use of numbers. For example a large modern factory built under the first five-year plan for the manufacture of bearings was known as GPZ-1 (*gosudarstvennyi podshipnikovyi zavod* — state bearings factory); all subsequent specialised bearings plants became known as GPZ-n.

In the present-day Russian Federation the numbering system lives on within the Ministry of Defence (MO), which still uses this method of identification for its research institutes and factories. The MO has numbered Central Research Institutes (TsNII), for example '4-i TsNII MO RF' at Bol'shevo, Moscow oblast', is the central institute serving the Strategic Missile Forces. Some TsNII are subordinate to individual services, e.g. '1-i TsNII VMF MO RF' is the navy's central institute for naval shipbuilding, St Petersburg.<sup>17</sup> In individual cases the full names of numbered institutes have been revealed, e.g. '38-i NII' is the Kubinka scientific research and test institute for tank and armoured weapons and equipment.<sup>18</sup> Repair works of the forces are numbered, e.g. ship repair factories are SRZ VMF (e.g. no. 35, Murmansk, nos 92 and 178, Vladivostok, and no. 176, Arkhangel'sk).<sup>19</sup> Aviation repair works are numbered ARZ, e.g. no. 388 ARZ MO, Primorskii krai.<sup>20</sup> In addition, each firing range (*poligon*) of the Ministry of Defence has a number, e.g. '4-i Gosudarstvennyi Tsentral'nyi poligon MO RF' is the Sary-Shagan range, Kazakhstan, for testing air defence systems.<sup>21</sup> A more general form of classification is the use of 'military unit' (*voennaya*

*chast'*, abbreviated to *v/ch*) numbers, usually followed by a five-digit number, e.g. *v/ch* 25840 is the above-mentioned '4-i TsNII'.<sup>22</sup>

Finally, another form of concealment by numbers should be noted: the numbered towns and settlements of the Ministries of Defence and of Atomic Energy. In the past the most secure of these locations were the 'closed' cities. The ten 'closed cities' of Minatom, first discussed in the Soviet press in the late 1980s and given new non-numerical identities following a decision adopted in 1994 have become well known, e.g. Arzamas-16 (now Sarov), Chelyabinsk-70 (Snezhinsk), Penza-19 (Zarechnyi), and Tomsk-7 (Seversk).<sup>23</sup> Less well known are the closed towns and settlements of the armed forces, e.g. the bases of the Strategic Missile Forces, although since 1994 some have also emerged into the open and been given open names. These closed towns and settlements are now known by the generic term 'closed territorial-administrative formations' (ZATO — *zakrytoe territorial'no-administrativnoe obrazovanie*).<sup>24</sup> However, there remain other sites and settlements of the Ministry of Defence which still have addresses at numbered locations without open names.

<sup>14</sup> Kokurin and Petrov (1997), 104.

<sup>15</sup> Simonov (1996), p. 236.

<sup>16</sup> Kokurin and Petrov (1997), p. 116

<sup>17</sup> *Oruzhie Rossii: katalog*, vol. 3, pp. 5 and 18-19.

<sup>18</sup> *Komsomolskaya pravda*, 28 June 1996, and *Segodnya*, 19 June 1997.

<sup>19</sup> *Sobranie zakonov Rossiiskoi Federatsii* (1998), no. 6, art.751.

<sup>20</sup> *Sobranie zakonov* (1998), no. 10, art.1223.

<sup>21</sup> *Sobranie zakonov* (1998), no. 9, art.1094.

<sup>22</sup> *Krasnaya zvezda*, 23 December 1994, and *Inzhenernaya gazeta*, 1994, no. 58.

<sup>23</sup> *Segodnya*, 26 May 1994.

<sup>24</sup> See Brock, G. (1998), 'Public finance in the ZATO archipelago', *Europe-Asia Studies*, vol. 50(6), 1065-81.

Table 1. Numbered State Aircraft Factories of the Soviet aviation industry to 1927

No.	Location	Further details	Source
1.	Moscow	the former 'Duks' works, earlier in the 1920s named <i>zavod</i> 'im. ODVF', then renamed 'im. Aviakhima'	C10 (vol. 1, p. 27), C51 (p. 313)
2.	Moscow	the former 'Gnome-Rhone' engine factory, from 1922 'Ikar'; merged with no. 4 on 2/3/27, and became <i>zavod</i> no. 24 'im. M.V. Frunze'	C10 (vol. 1, pp. 24, 49, 59, and 413), C51 (p. 313)
3.	Leningrad	originally the old 'Russko-Baltiiskii zavod', renamed the 'Petrogradskii ob"edinenniy zavod' and from 1922 'Krasnyi letchik'; became <i>zavod</i> no. 23 in 1927	C10 (vol. 1, pp. 22, 413), C51 (p. 313)
4.	Moscow	the former 'Motor' factory, in 1923 merged with the 'Amstro' works and absorbed no. 6 (Moscow) below — the latter number being switched to the 'Russkii Reno' works at Rybinsk (below)	C10 (vol. 1, p. 24), C51 (p. 313)
5.	Moscow	the former factory of F. Moksa, subsequently aircraft factory 'Samolet'; became <i>zavod</i> no. 25 in 1927	C10 (vol. 1, pp. 23, 413)
6.	Moscow	the former 'Salmson' engine factory, subsequently renamed 'Amstro'; absorbed by no. 4 above in 1923	C10 (vol. 1, pp. 24, 74), C51 (p. 313)
6.	Rybinsk	a new no. 6, the former 'Russkii Reno' works and GAZ (automobiles) no. 3, converted to aircraft from 1923; became <i>zavod</i> no. 26 in 1927	C10 (vol. 1, p. 24), C51 (p. 313)
7.	Penza	the former 'Lebedev' aircraft factory; ceased production	C10 (vol. 1, p. 22), C51 (p. 313)
7.	Moscow	a new no. 7, established originally as the new 'Russko-Baltiiskii zavod' (Fili), then GAZ (automobiles) no. 2 and '1-i BTAZ' of the automobile industry under the 'Prombron' association, converted to aircraft; renumbered <i>zavod</i> no. 22 in 1927	C10 (vol. 1, pp. 23, 413)
8.	Moscow	the former 'Aerotekhnicheskii zavod', subsequently 'Propeller'	C10 (vol. 1, p. 25), C51 (p. 313)
9.	Aleksandrovsk (Zaporozh'e)	the former 'Deka' factory, subsequently the 'Bol'shevik' engine factory; became <i>zavod</i> no. 29 in 1927	C10 (vol. 1, pp. 25, 413)
10.	Taganrog	factory of the former AO 'Lebed'; became <i>zavod</i> no. 31 in 1927	C10 (vol. 1, pp. 23, 413)
11.	Odessa	closed in 1920s and became sawmill subordinate to no. 8 above	C10 (vol. 1, pp. 22, 27)
12.	Kiev	subsequently transferred to Glavvozdukhflot (the civil air fleet)	C10 (vol. 1, p. 22)
13.			
14.	Sarapul'	ceased to exist	C10 (vol. 1, p. 22)
15.	Simferopol'	closed in 1920s	C10 (vol. 1, p. 22)
16.	Moscow	the 'Aerolak' factory, formerly of I.K.Kolka	C10 (vol. 1, p. 25)

## Sources:

- C10 Byushgens, G.S., ed. (1992–4), *Samoletostroenie v SSSR. 1917–1945*, vols 1–2, Moscow  
 C51 Yakovlev, A.S. (1982), *Sovetskie samolety*, 4th edn, Moscow (data as of June 1920)

## Glossary

AO		joint stock company
APO		aviation production association
<i>filial</i>		factory affiliated to another in a subordinate relationship
GAZ	(1)	State Automobile Factory
	(2)	State Aircraft Factory
GKVT		State Committee for Military Equipment
GP		state enterprise
GU, Glav–		chief (main) administration (directorate)
GUVP		Chief Administration for War Industry
GVMU		Chief War–Mobilisation Administration
<i>im. (imeni)</i>		named after
KB		design bureau
MAP		Ministry of Aircraft Production
MRT		Ministry of the Radiotechnical Industry
MSP		Ministry of the Shipbuilding Industry
MV		Ministry of Armament
MVD		Ministry of Internal Affairs
NII		scientific research institute
NKAP		People’s Commissariat of the Aircraft Industry
NKB		People’s Commissariat of Ammunition
NKEP		People’s Commissariat of the Electrical Industry
NKKhimProm		People’s Commissariat of the Chemical Industry
NKMV		People’s Commissariat of Mortar Armament
NKNeftProm		People’s Commissariat of the Oil Industry
NKOP		People’s Commissariat of the Defence Industry
NKRechFlot		People’s Commissariat of the River Fleet
NKRezinProm		People’s Commissariat of the Rubber Industry
NKRybProm		People’s Commissariat of the Fishing Industry
NKSP		People’s Commissariat of the Shipbuilding Industry
NKStankProm		People’s Commissariat of the Machine Tool Industry
NKTankProm		People’s Commissariat of the Tank Industry
NKTP		People’s Commissariat of Heavy Industry
NKTsvetM		People’s Commissariat of Nonferrous Metallurgy
NKV		People’s Commissariat of Armament
NKVD		People’s Commissariat of Internal Affairs
NPO		science production association
OKB	(1)	experimental design bureau
	(2)	special design bureau (usually of NKVD–MVD)
PO		production association
SKB		special–purpose design bureau
<i>tsekh</i>		workshop
<i>verf</i> <sup>o</sup>		dockyard
VPK		military–industrial complex
VSNKh		Supreme Council of the National Economy
<i>z–d (zavod)</i>		factory