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COMMERCIAL AIR TRANSPORTATION IN THE UNION OF SOVIET SOCIALIST REPUBLICS

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AS the years proceed, progressively less information becomes available from the Soviet Union concerning the development of its air transportation. In examining the material that has been released during the past five decades, much confusion arises in the initial attempts to piece this material together chronologically and realistically show how the development of air transportation in the Union of Soviet Socialist Republics has proceeded. Meager official material is available from the U.S.S.R., and the confusion arises primarily from the masses of material containing rumors, unverified and unreliable reports, and tainted or incorrect reports, and the various articles which evidently refer to the same topic by different nomenclatures and sometimes with different chronological order.¹

* The author is presently preparing a text to present the chronological development of the aeronautical industry in the Soviet Union and to briefly examine the capabilities and potentialities that seem likely in the near future. This paper is, essentially the chapter from this book which is concerned with the development and future potentialities of civil aviation in the Soviet Union.

¹ This paper is based primarily on the existing material that has been released for publication in one form or another. At the time of this writing there are only five books (in the English language) concerning aeronautics within the Soviet Union, though articles and papers are numerous. Of the five books, *Jane's All the World's Aircraft* (annual) perhaps contains the most general reliable data; *The Soviet Air Force* by Asher Lee is an excellent source of information concerning the Soviet military air power through 1948; and Cain's and Voaden's *Military Aircraft of the U.S.S.R.* serves its purpose as a pamphlet for aircraft identification. Molokov's *Soviet Civil Aviation*, while published in Moscow for propaganda purposes, contains data which seems to be reliable — though care should be taken in the interpretation of the contents. *The Story of Soviet Aviation* by Craven is an excellent literary example of a publication by a pro-Soviet Communist or Communist group outside of the Union of Soviet Socialist Republics. Articles of this nature are frequently encountered, and they do not, as is usually the case with official releases from the Soviet Union, only cloud the precise meaning of the data but present erroneous and distorted facts as well.

Four basic problems presented themselves as a prerequisite to the preparation

DEVELOPMENT OF U.S.S.R. AIRLINES

After the Revolution, Lenin had been convinced almost immediately of the importance of aviation to the future of the Soviet Union. It was imperative that commercial air transport facilities be initiated and expanded throughout the country in order to maintain adequate communications and unification of the territory which consisted of one-sixth of the land mass of the earth. In Czarist Russia, the Trans-Siberian Railroad was the only link between Western (European) Russia and the vast territorial expanses east of the Urals. Even in Western Russia rivers provided much of the necessary commercial transportation media, and many of these waterways were unnavigable and frozen during the greater part of the year; it was only during the few summer months that goods could be transported safely over the northern water routes. Trucks and automobiles were almost non-existent in the early twenties, and to this day the Soviet road and highway system has remained considerably underdeveloped. It may be safely stated that when the Bolsheviks assumed authority in the U.S.S.R., the majority of the means of communication and transportation were crude and primitive, and the facilities were in an embryonic state of development.

The "Deruluft" Company

The first commercial airline company to be established in the Soviet Union was the "Deruluft"² Company, which was a jointly-owned Soviet-German company. This company was formed in November, 1921, and was supposedly based on equality. The supreme governing body was a "Board of Inspection," composed of an equal number of members of the two nations. There were two managers, one German and one Russian, and one half of the flying staff as well as the mechanics were supposed³ to have come from each country. On May 1, 1922, the first commercial aerial traffic was inaugurated with plane service between Moscow and Konigsberg, and a connecting all-German flight from Konigsberg to Berlin. During 1922, there were two round-trip flights per week over this route, and by 1924, there were six round-trip flights operated weekly. In June, 1928, an additional line was created, connecting Leningrad with Tallin and Riga; and the further development of the "Deruluft" Company rapidly progressed. It may be added, however, that this company was amazingly reliable; in 1926, the service was operated to within 99.6 percent of its schedule, and during the course

of this manuscript. These were, in their respective order: (1) The initial research and the collection of all the available material pertaining to the Soviet aircraft industry; (2) The critical examination or process of sifting this material in order to separate the reliable and "seemingly" valid material from the apparently erroneous and distorted material; (3) The unification and piecing of this material together, and its comparison to similar data concerning aeronautical development in other countries; (4) The future projection of the development of civil aviation in the Soviet Union.

² Deutsch-Russoische Luftverkehrs-Gesellschaft.

³ Though the personnel and management were theoretically based on equality, during the early stages of operation the company's personnel consisted almost entirely of Germans.

of 518 flights during that year, the "Deruluft" Company carried over 1,100 passengers and a total of 123,469 kilograms of luggage, goods, and newspapers.

The concession granted to the "Deruluft" Company in 1921 ended on October 31, 1926. The "Council of People's Commissaries" ("Sovnarkon") then ratified a new agreement⁴ which was valid until December 31, 1931, and after that date it was to be automatically prolonged until steps were taken by either party to the contrary. In 1936, when the diplomatic relations between Germany and the Soviet Union became strained, this company was dissolved.

A regulation was issued by the Soviet "Council of Labor and Defense"⁵ on February 9, 1923, stating:

1. The general technical control of the airlines existing within the Soviet Union and those airlines which will be established in the future are temporarily entrusted to the "General Administration of the Red Air Fleet," the actual work to be carried out by the Inspectorate of Civil Aviation. Under "technical control" are included the classification of the types of aircraft and their equipment, the use of airdromes and hangers, rules of the air, regulations regarding the use of radio, signaling, log books, and other documents, and technical personnel.

2. The "Civil Aviation Council," which is responsible to the "General Administration of the Red Air Fleet," shall have control over the regulations concerning the opening of new airlines and to their operation. This Council will be assisted by the various departments such as the postal and telegraph organs.

This arrangement was stated as being temporary, and when commercial aviation in the Soviet Union had become more fully developed, a special department governing civil aeronautics was anticipated.

The "Dobrolet" Company

The first all-Russian commercial airline to be established was the "Dobrolet" Company.⁶ In March of 1923, Krasnostchekoff, chairman of the "Russian Mercantile Trading Bank," was responsible for the foundation of this company. The initial capital was 500,000 gold roubles but within a few months it had been increased to over 2,000,000 gold roubles, due to the enthusiastic support of the populace. The "Dobrolet" Company was organized along the same lines as the "Russian Volunteer Mercantile Fleet," and the government agreed to initial support and subsidization until it became self-supporting. The first several months after the initial organization were spent by a technical commission engaged in studying and examining the various centers and possible air-routes. As a result of this investigation, the air services

⁴ Under the new agreement the "Deruluft" Company was to carry out a regular service, six days per week from May 1 to October 1, between Moscow and Berlin. Each of the governments (German and Soviet) further agreed to pay a subsidy of 110,000 dollars to the company for the period covered by the agreement.

⁵ See the 1924 issue of *Jane's All the World's Aircraft*.

⁶ The "Dobrolet" Company is also referred to as the "All-Union Joint-Stock Company of the Volunteer Air Fleet" or the "Russian Voluntary Air Fleet Company."

were centered about Moscow, and the initial route, Moscow to Kazan, was opened in 1924. Within a very short time this company abandoned the concept of Moscow to serve as their "air center" and soon changed their centers of operation to the frontier routes in the republics of Central Asia and Siberia. Almost immediately this company became an important carrier of mail and valuable freight. Previously, the mail and freight had been carried by camels, horses, or water vessels, and the time for such transportation of goods was reduced from a matter of days to a matter of hours with the advent of new air-routes east of the Urals. The "Dobrolet" Company continued to progress and expand until it was absorbed by the "Dobroflot" Company in 1930.

The "Ukrvozdukhput" Company

In 1923, the "Ukrvozdukhput"⁷ Company was also formed, and after a brief organizing period its first lines were in operation between Kharkov and Kiev and Kharkov and Odessa. This company's air centers were in the Ukraine and Crimean regions, and even before any air routes had been established the "Civil Aviation Council" had appropriated 140,000 gold roubles to be utilized for the construction of concrete hangars at the Kharkov and Kiev airdromes. In 1925, the "Ukrvozdukhput" Company absorbed the "Zakavia" Company and then continued to expand until it was absorbed by the "Dobroflot" Company in 1930.

The "Zakavia" Company

The "Zakavia"⁸ Company was established in July, 1923, with an initial capital of 500,000 gold roubles. Its object was to establish a trans-Caucasian airline and in 1924, its first air service was in operation, from Tiflis to Baku. This company had a short-lived independent existence as it was apparently absorbed by the "Ukrvozdukhput" Company during 1925.

The "Junkers" Company

Shortly after the revolution, the German "Junkers" Company established a branch factory (to produce aircraft) in Moscow. Many of the early commercial planes utilized by the Soviet airline companies were manufactured by this firm. In 1923, the "Junkers" Company concluded an agreement with the Soviet government whereby they would establish an airline service between Sweden, the Soviet Union, and Persia (Iran). Toward the end of 1924, this company was operating regular flights from Baku to Enzeli to Teheran. It is difficult to present the exact date of the termination of this company's air services, but it is apparent that its commercial air transport activities had ceased by 1930, at which time it was probably absorbed by the "Dobroflot" Company.

⁷ The "Ukrvozdukhput" Company is also referred to as the "Ukrainian Aerial Traffic Company" or the "Ukrkrima Aviation and Air Traffic Company."

⁸ The "Zakavia" Company is also referred to as the "Trans-Caucasian Air Traffic Company."

The "Dobroflot" Company

In 1929 and 1930, the "Dobroflot"⁹ Company was established under the first Five-Year Plan of the Soviet regime. The "Dobroflot" Company was a government-owned organization and it was charged with the general development of civil aviation in the Soviet Union. Upon its organization, this company absorbed all the existing all-Soviet airline companies. In 1932, the "Dobroflot" Company was dissolved and all the commercial air services were reorganized under the "Chief Administration of the Civil Air Fleet."

"Transaviatsia"

Further development and the growing importance of aviation in the Soviet Union caused the creation, in 1932, of the "Chief Administration of the Civil Air Fleet," attached to the "Council of People's Commissaries"; this Administration assumed complete control over civil aviation. "Transaviatsia" was also formed in 1932; this organization was the practical body under the "Chief Administration of the Civil Air Fleet" and it was concerned with the practical operation of the air services previously operated by the "Dobroflot" Company.

"Aeroflot"

In 1934, a resolution by the "Council of People's Commissaries" abolished "Transaviatsia" and at the same time reorganized the "Chief Administration of the Civil Air Fleet," which is referred to as "Aeroflot." The principal change was that twelve subordinate territorial administrations were established as follows:

(1) The Moscow Regional Management; (2) The Ukraine Regional Management; (3) The Azov-Black Sea Regional Management; (4) The Trans-Caucasus Regional Management; (5) The Caucasus Regional Management; (6) The Central Asia Regional Management; (7) The Ural Regional Management; (8) The Volga Regional Management; (9) The Western Siberia Regional Management; (10) The Eastern Siberia Regional Management; (11) The Far East Regional Management; (12) The North Regional Management.

Each of these territorial administrations had a manager, who was put in charge of the operation of the air routes within his management, which had previously been operated by "Transaviatsia." A resolution of May 19, 1934, further defined the responsibilities of the "Chief Administration of the Civil Air Fleet" as including the direction of operations of the civil air fleet, the administration of air routes, the projection of new air routes, the establishment and operation of air navigation facilities, the technical supervision and inspection of aeronautical personnel, aircraft, and aviation facilities, aviation training, and aeronautical research.

⁹ The "Dobroflot" Company is also referred to as the "All-Union Combine of the Civil Air Fleet."

A code which became effective on August 7, 1935, denoted to the "Chief Administration of the Civil Air Fleet" supervisory control over all civil aviation in the Soviet Union, including air mail and aeronautical signaling devices. The Administration received the authority to fix the rates for the transportation of passengers, baggage, cargo, and mail as well as to regulate the charges for the utilization of the ground facilities. Aside from those air services operated by the "Chief Administration of the Northern Sea Routes," regular airlines were limited to the services operated by "Aeroflot" and even the ownership of aircraft by individuals or other state organizations was subject to permission from the "Chief Administration of the Civil Air Fleet."

The "Chief Administration of the Civil Air Fleet" has remained as the authoritative body concerning the administration and operation of civil aeronautics in the Soviet Union and today it occupies virtually a cabinet position.

"Glawsewmorputj"

In 1933, the "Administration of the Northern Sea Routes,"¹⁰ which is referred to as "Glawsewmorputj," was established with the primary objective of developing the northern sea routes to facilitate ship passage through the Arctic Ocean from the Atlantic to the Pacific Ocean. Within a very short time this Administration became extremely important as an air transport service for the distant gold fields, fisheries, and fur trading stations. It was not long before it was actively engaged in Arctic exploration, surveying, ice floe reconnaissance, and meteorological studies. The first Arctic airlines followed the great Siberian rivers in a north-south direction, but since the end of 1935 other lines running east-west have been established. Many isolated weather stations and northern settlements are, even today, completely dependent upon the air transportation facilities of this organization, and such facilities provide their only contact with the remainder of the Soviet Union.

The "Administration of the Northern Sea Routes" has been continually expanded and developed and today it is essentially a parallel organization to the "Chief Administration of the Civil Air Fleet."

INTERNATIONAL AND JOINT AIRLINE COMPANIES

"Aeroflot" has, from time to time, had extensions of its operations into foreign territories, but by and large, it has been primarily concerned with the development of the air services within the Soviet territories. As has been discussed earlier, the first air service in the Soviet Union consisted of a joint Soviet-German organization, the "Deruluft" Company, which operated on the principle of "equality." This airline was also the first international airline in the Soviet Union.

¹⁰ The "Administration of the Northern Sea Routes" is also referred to as the "Northern Directorate," "Glawsewmorputj," "Glawmorput," or "Aviaarktika."

In 1939, a jointly owned Sino-Soviet airline company, "Hamiata,"¹¹ was formed on similar principles of the earlier "Deruluft" Company. The first services were in operation during 1939, in a route extending from Alma Ata (in Soviet Turkestan) to Hami (in the Sinkiang Province of China). This organization is still in operation and it has been extended since the Communists have taken over the authority in China proper.

A joint Hungarian-Soviet airline company, the "Maszovlet,"¹² was established and in operation in 1946. This company's air routes connect Budapest with Moscow and both of these cities with the other European centers.

The "TARS,"¹³ a joint Rumanian-Soviet airline company, was also formed in 1946. Via this line, Bucharest and Moscow are connected to the other nearby centers.

In 1947, a joint Yugoslavian-Soviet airline company, the "JUSTA,"¹⁴ was formed and put into operation, connecting Belgrade with Moscow. It is believed that this company ceased operations as a joint company soon after the Yugoslav-Soviet diplomatic relations began to deteriorate.

At the present time, for all practical purposes, the Soviet Union also controls Poland's "LOT"¹⁵ and Czechoslovakia's "CSA,"¹⁶ as well as the air communications in both Bulgaria and Albania. Thus, it can be seen that the present airline company organization under the authority of the Soviet Union extends well into Eastern and Central Europe, where the airlines of the Western European and American countries make connections with those of the satellite nations.

AIRCRAFT AND OTHER FACILITIES OF THE CIVIL AIR FLEET

Since the aircraft industry within the Soviet Union was almost non-existent during the early stages of commercial air transport development, most of the first airplanes were of foreign design and imported into the U.S.S.R. Such craft as produced by "de Havilland," "Vickers-Vimy," and "Junkers" were initially used by the "Dobrolet" Company. During the first six months of 1924, the Soviets purchased about 700 modern (at that time) aircraft from Holland and Italy.

It was not long before the Soviets had begun to develop their own aircraft industry and in 1932, they were producing the "Kalinin K-5," which was a commercial, ten-seat, single-engine monoplane. This plane went into service on the Soviet airlines early in 1933, and proved to be one of the first successful commercial planes of Soviet design. The A.N.T.-series, designed by Tupolov; the K-series, designed by Kalinin; and the Stal-series designed by Bartini and Poutilov, were the most

¹¹ "Hamiata" is also referred to as the "Sino-Soviet Aviation Corporation."

¹² "Magyar-Szoviet Legiforgalm Tarsasag."

¹³ "Transporturi Aeriene Romano Sovietice."

¹⁴ "Jugoslovenska Sovjet Transport Aviacija."

¹⁵ "Polskie Linie Lotnicze."

¹⁶ "Ceskoslovenske Aerolinie."

widely utilized commercial airplanes until the outbreak of the second world war.

After the war, the main type of aircraft on the Soviet airlines was the Soviet version of the American "Dakota" (DC-3); this was a twin-engine, 27-32 seat passenger and freight airliner, designated as the PS-84. At present (1952), the civil air transport fleet consists of over 300 aircraft, primarily Il-12's, PS-84's, ShchE-2's, and Yak-16's. The Il-18, a four-engine transport similar in appearance to the Il-12, is also coming into wide use for the long-distance, trans-continental flights.

Airdromes, hangars, emergency camps, and signaling systems underwent a rapid expansion at the outset of commercial aeronautical development. By 1935, all the main airports had waiting rooms for passengers, information bureaus, postal and telegraph offices, restaurants, and ticket offices. The commercial pilots and technical personnel are now trained with modern facilities and the calibre of today's Soviet commercial pilot is roughly equivalent to that of the present commercial pilot in Great Britain or the United States.

Lighter-than-Air Craft

It is a point of interest that the Soviet Union was the only country which, before World War II, maintained a regular airline using lighter-than-air craft.¹⁷ This air service consisted of semi-rigid DP-9 airships which connected Moscow with Sverdlovsk, in the Urals. Similarly, lighter-than-air craft have been frequently utilized in the Arctic services.

A non-rigid dirigible (similar to the Goodyear G or L type), the "Pobyeda" ("Victory"), was in use for civil air transportation in 1946, shortly after the war. Another airship, the "Patriot," was completed in 1946. This latter airship is believed to have been a passenger carrier with accommodations for ten to twelve passengers.

COMMERCIAL AIR TRANSPORTATION DEVELOPMENT

The extreme importance of air transportation to the Soviet union can be demonstrated by a table taken from an article by V. A. Zarzar, General Manager of the Civil Aviation of the U.S.S.R., which appeared in a 1929 issue of *L'Aviazione*, an Italian aeronautical magazine. This table shows the time saved by aerial flights in comparison with all other means of transportation which existed in the mentioned places in 1929:

| <i>Route</i> | <i>Time via Air Traffic</i> | <i>Time via Other Means of Transportation</i> |
|--------------------------------|---------------------------------|---|
| Tashkent - Dyushambe | 10 hours | 5-7 days |
| Frunze - Alma Ata | 2 hours | 30-40 hours |
| Tashkent - Kabul | 1 day | 30 days |
| Irkutsk - Yakutsk | 2-4 days | 18 days (summer) 30 days (winter) |
| Moscow - Irkutsk | 36 hours | 5-6 days |

¹⁷ Before the war, the "Tsiolkovsky Dirigible Construction School," at Moscow, was the center of dirigible work in the U.S.S.R. Besides the construction of dirigibles, this school conducted advanced training for dirigible personnel.

Aside from such cases as exhibited in the table, air facilities have provided the ability to settle new territories and regions that would otherwise not be possible. The importance of aeronautics within the Soviet Union can not be underestimated!

The Aeronautical activities in the U.S.S.R., like the rest of its industrial activities, are the result of a planned economic development program. It is difficult to make an accurate comparison between such a development and the development that would have resulted from a natural growth in a free economy, but some comparisons shall be attempted.

A table of Soviet civil air transport data has been compiled from what has been considered the most reliable available sources;¹⁸ this table is presented below and consists of statistical data concerning the total air route length, the number of passengers carried, the weight of mail carried, and the weight of freight carried in the Soviet Union for the various years. These statistical data have been plotted as a function of time on semi-logarithmic paper, the year 1946 coinciding with the year 1940 to obliterate the effect of the second world war, during which time the civil air transportation facilities were attached to the armed forces. From such plots, the amazing regularity of the data and small deviation of the data from the fitted curves are immediately observed. The result of a planned economy is evidenced by the fact that there are no irregularities and eruptions such as are demonstrated by the depressions and other whimsical occurrences in the similar data for such countries as the United States or Great Britain.¹⁹

Though the commercial aeronautical development has been far more spasmodic in the countries based upon a free economy, it is appropriate to point out that, though ambitious aeronautical programs have been designed in the Five-Year Plans, such programs are rarely achieved. The tables on page 137 present the aeronautical goals and results of the first Five-Year Plan.

Although 116 percent of the anticipated total route length was realized, nothing was stated concerning the frequency and regularity of the flights over these additional routes. By 1933, it appeared that the flights were spasmodic and were carried out only during the daylight hours and summer months of the year in many regions. Further evidence of the irregularity can be noted by the achievement of only 33 percent of the planned total plane distance covered. Though the total

¹⁸ These sources include *American Aviation*, *Aviation Age*, *Aviatsiia i Khimii* (Aviation and Chemistry), *L'Aviazione* (Aviation), *C.A.B. Statistics for Selected World Air Carriers*, *Grazhdanskaia Aviatsiia* (Civil Aviation), *Jane's All the World's Aircraft*, *Khimiia i Oborona* (Chemistry and Defense), *Pravda*, (Truth), *Samolet* (Plane), *Soviet Civil Aviation* (By V. Molokov), and the *World Aviation Annual*.

¹⁹ Of course it is possible that all the data that has been released from the Soviet Union has been erroneous and prearranged. Such a concept would be substantiated if similar feeling existed concerning the other industrial data which has been released. To carry out such a program of releasing prearranged, erroneous data concerning the industrial development of the Soviet Union would require a tremendous force and would be an extreme effort for the government of any country. Though such extreme efforts are indeed possible in the U.S.S.R., it does not seem likely that such a program has been carried out.

SOVIET CIVIL AIR TRANSPORT DATA

| Year | Total U.S.S.R. Air-Route Length (kms.) | Air- Passengers Carried in the U.S.S.R. (thousands) | Air-Mail Carried in the U.S.S.R. (metric tons) | Air-Freight Carried in the U.S.S.R. (metric tons) | Total Goods (Mail and Freight) Carried by Air in the U.S.S.R. (metric tons) |
|--------------|--|--|--|---|---|
| 1922 | 1,200 | .3 | | | 13.8 |
| 1923 | 1,610 | 1.4 | | | 27.9 |
| 1924 | 4,400 | 2.6 | | | 48.3 |
| 1925 | 4,984 | 3.9 | | | 76.8 |
| 1926 | 6,392 | 4.0 | | | 84.6 |
| 1927 | 7,022 | 7.1 | | | 170.4 |
| 1928 | 11,971 | 9.0 | | | 228.7 |
| 1929 | 18,442 | 12.8 | | | 340.7 |
| 1930 | | 17.8 | 130 | 150 | 280 |
| 1931 | | 23.0 | 363 | 250 | 613 |
| 1932 | 31,830 | 27.2 | 481 | 500 | 981 |
| 1933 | 53,182 | 41.6 | 1,920 | 987 | 2,907 |
| 1934 | 68,050 | 65.0 | 3,359 | 4,703 | 8,062 |
| 1935 | 77,088 | 111.0 | 6,500 | 10,200 | 16,700 |
| 1936 | 96,004 | 165.0 | 7,900 | 35,000 | 42,900 |
| 1937 | 104,006 | 211.0 | 10,079 | 40,320 | 50,399 |
| 1938 | 116,005 | 292.7 | 11,983 | 50,960 | 62,943 |
| 1939 | 135,007 | 307.0 | 12,899 | 44,413 | 57,312 |
| 1940 | 142,007 | 358.7 | 14,300 | 45,620 | 59,920 |
| 1941 - 1944* | | | | | |
| 1945 | | 624.6 | | 72,700 | |
| 1946** | | 1,100 | | | |
| 1947 | 150,000 | 1,500 | | 109,000 | |
| 1948 | 175,000 | | | | |
| 1949 | 221,000 | | | | |
| 1950 | 241,000 | | | 218,000 | |
| 1951 | | | | | |
| 1952 | | | | | |

* No data is available for this period. During the "Great Patriotic War" (World War II), the entire Soviet Civil Air Fleet was devoted to military operations.

** The U.S.S.R.'s post-war civil aviation statistical progress is overshadowed. Almost all of the post-war data is expressed in terms of percentage growth from an undisclosed base figure.

weight of goods carried was 85.6 percent of the planned figure, these goods must have been transported at the expense of limiting the total number of passengers to be carried. To realize the lack of fulfillment of the First Five-Year Plan, it might also be added that at the time of the presentation of this plan, it was stated that the anticipated figures were regarded as the minimum figures. It was also proposed that, within the first five-year period, the main airlines of the Soviet Union would be working throughout the year, with daily flights, night and day. In 1933, there was a decided scarcity of night-flying facilities and only the major airports had signal beacons and landing light equipment. In 1950, only two scheduled flights per week were operated by "Aeroflot" between Moscow and the far eastern cities such as Khabarovsk and Vladivostok, and before October 1947, these flights were not flown with any regularity. Only a few seats were available for passengers, the rest of the plane being utilized for cargo, and until May of 1948 the flights to the far eastern regions operated only during the daylight hours.

Although the presentation of the First Five-Year Plan was the presentation of the "extreme," the following Five-Year Plans having been more fully achieved, it adequately demonstrated the "super-ambitions"

THE ANTICIPATIONS OF THE FIRST FIVE-YEAR PLAN

| Year | Total Route Length (kms.) | Thousands of Passengers Carried | Total Metric Tons of Goods Carried | Total Plane Distance Covered (kms.) |
|---------|---------------------------|---------------------------------|------------------------------------|-------------------------------------|
| 1928-29 | 18,442 | 12.8 | 340.7 | 4,399,944 |
| 1929-30 | 26,262 | 30.0 | 837.9 | 9,252,608 |
| 1930-31 | 31,342 | 51.7 | 1,560.0 | 12,766,520 |
| 1931-32 | 41,513 | 72.2 | 2,141.8 | 17,709,320 |
| 1932-33 | 45,893 | 110.2 | 3,381.8 | 28,235,640 |

THE RESULTS OF THE FIRST FIVE-YEAR PLAN

| | | | | |
|------|--------|------|-------|-----------|
| 1929 | 18,442 | 12.8 | 340.7 | 4,399,944 |
| 1930 | | 17.8 | 280 | 5,900,000 |
| 1931 | | 23.0 | 613 | 7,000,000 |
| 1932 | 31,830 | 27.2 | 981 | |
| 1933 | 51,182 | 41.6 | 2,907 | 9,304,000 |

THE RESULTS AS A PERCENTAGE OF THE ANTICIPATION OF THE FIRST FIVE-YEAR PLAN

| | | | | |
|------|--------|--------|--------|--------|
| 1929 | 100.0% | 100.0% | 100.0% | 100.0% |
| 1930 | | 59.3 | 33.4 | 63.8 |
| 1931 | | 44.5 | 39.3 | 54.9 |
| 1932 | 76.5 | 37.7 | 45.8 | |
| 1933 | 116.0 | 37.8 | 85.7 | 33.0 |

concerning the aeronautical development in the Soviet Union. It also cannot be denied that remarkable commercial aeronautical developments have taken place under the Soviets in the U.S.S.R. and it seems unlikely that such expansion would have occurred had the society been based upon a free economy.²⁰

The development of commercial air transportation can best be shown by the data in the table of "Soviet Civil Air Transport Data." If the data in this table are accepted, it is not difficult to carry the projection of these figures into the immediate future, as well as the present (where the data is absent). If this is done, it can be seen that, in 1952, the total U.S.S.R. air route length was about 270,000 kilometers, about 8,000,000 passengers were carried by the Soviet airlines, approximately 325,000 metric tons of freight and 23,000 metric tons of mail or 348,000 metric tons of goods were transported by the Soviet airlines, and about 185,000,000 kilometers were covered by the planes of the commercial air fleet. Projecting into the future, the following data is obtained:

| Year | Total Route Length (kms.) | Thousands of Passengers Carried | Total Metric Tons of Goods Carried | Total Plane Distance Covered (kms.) |
|------|---------------------------|---------------------------------|------------------------------------|-------------------------------------|
| 1952 | 270,000 | 8,000 | 348,000 | 185,000,000 |
| 1954 | 305,000 | 15,400 | 465,000 | 225,000,000 |
| 1956 | 335,000 | 30,500 | 585,000 | 270,000,000 |
| 1958 | 365,000 | 61,000 | 735,000 | 310,000,000 |
| 1960 | 390,000 | 115,000 | 880,000 | 345,000,000 |

Similar data for some of the pre-war years are:

| | | | | |
|------|---------|-------|--------|------------|
| 1922 | 1,200 | 0.3 | 13.8 | 137,000 |
| 1926 | 6,392 | 4.0 | 84.6 | 1,313,130 |
| 1932 | 31,830 | 27.2 | 981 | |
| 1936 | 96,004 | 165.0 | 42,900 | 35,200,000 |
| 1940 | 142,007 | 358.7 | 59,920 | |

²⁰ It can also be definitely stated that there is no justification for some of the shorter air routes in the Soviet Union, from an economic standpoint as well as that of efficiency, and such routes would be short-lived in a country based upon a free economy.

Thus, if the accuracy of this data is accepted, the total route length in 1952 was 190 percent of the pre-war (1940) total route length, 848 percent of the 1932 total route length, and 22,500 percent of the total route length in 1922. Furthermore, the total route length for 1952 is expected to be increased by an additional 24.0 percent by 1956 and by 44.5 percent by 1960.

Similarly, the number of passengers carried in 1952 was 2,230 percent of the number of pre-war (1940) passengers carried and 29,400 percent of the number of passengers carried in 1932. The number of passengers carried in 1952 is expected to increase by an additional 281 percent by 1956 and by 1,340 percent by 1960.

In 1952, the total weight of goods transported was 580 percent of the pre-war (1940) figure, 35,500 percent of the 1932 figure, and 2,520,000 percent of the total weight of goods transported by air in 1922. The total weight of goods transported by air is expected to increase by an additional 68.3 percent by 1956 and by 153 percent by 1960.

The total plane distance flown, in 1952, was about 230 percent of the pre-war plane distance flown. This figure is expected to increase by about 46 percent by 1956 and 87 percent by 1960.

The Soviet authorities seem to have a full realization of the importance of commercial aeronautical development and air transportation has been found indispensable in the organization and administration of the vast expanses of the U.S.S.R. The tremendous distances between the various centers and regions of the Soviet Union emphasize the benefits which may be reaped from a highly developed system of air transportation. This is magnified by the absence of a highly developed system of roads and railways, which might otherwise provide competition for the airways in some regions.

COMPARISON WITH U.S. DOMESTIC AIRLINES

It is appropriate, perhaps, to compare the Soviet air transportation developments with those exhibited by the U.S. domestic airlines. In 1951, the passenger fares on the Soviet commercial airlines ranged from 6.5 cents per mile, for the long hauls, to 8.5 cents per mile, on the shorter hauls, at the then prevalent official rate of exchange. In the same year, the passenger fares on the U.S. domestic airlines ranged from 5.6 cents per mile, for first-class service, to 4.5 cents per mile for air-coach service.

The time-rates of increase of air passengers carried and total plane distance flown have been far greater in the United States than in the Soviet Union. In 1925, the number of passengers carried by the Soviet airlines and the number of passengers carried by the U.S. domestic airlines were about equal. By 1930, the Soviet airlines carried 17,800 passengers as compared to 375,000 passengers carried by the U.S. domestic airlines. During the "great depression" the number of passen-

gers carried by the U.S. domestic airlines remained fairly constant, while the number carried by the Soviet airlines continued to increase. In 1934, the Soviet airlines carried 65,000 passengers in comparison to 462,000 passengers carried by the U.S. airlines. By 1947, about 1,500,000 passengers were carried by the Soviet airlines; the comparable figure for the U.S. domestic services was 13,189,000. Similar figures could be given for the total plane distance flown.

Pioneers in Air Freight

It is an established fact that the Soviets were the undisputed "pioneers" in the transportation of air freight. As recently as 1938, the Soviet airlines carried 50,960 metric tons of freight as compared to 3,330 metric tons carried by the U.S. domestic airlines. Though, before World War II, the Soviet Union was far ahead of the United States with respect to the quantity of freight transported by air, by 1946, the weight of air freight carried by each country's airlines was almost equal.

The total U.S.S.R. air route length is apparently greater than the total air route length of the domestic airlines within the United States. But it must be remembered that many air operations within the Soviet Union are spasmodic, and the frequency and regularity of the Soviet flights are but a fraction of those existing in the United States. As was earlier pointed out, there is little justification for many of the shorter air routes in the Soviet Union and such routes would be short-lived in a country based upon a free economy.

Many theories can be advanced concerning the underlying causes of the greater time-rates of aeronautical development in the United States as compared to those of the Soviet Union. The most outstanding cause, of course, has been the much greater industrialization of the United States as compared to that which existed in the Soviet Union. During the war, the civil airline facilities of the U.S.S.R. ceased to exist as an independent unit, so that their development in 1946 was approximately equivalent to their development in 1940. During this period, the civil airlines in the United States were not disrupted to the extent of that experienced by the Soviet airlines, and the U.S. domestic airlines continued to expand. Most of the inherent qualities of the economic systems affect the time-rates of aeronautical development in one direction or another. The pre-planning of a system should theoretically enable an increased time-rate (*as compared to the same unit based upon a free economy*); at the same time such limitations as those concerning the freedom of movement of the populace contribute toward decreasing time-rates of development.²¹

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