SOVIET INTERDICTION OPERATIONS, 1941-1945

Oleg Hoeffding

A Report prepared for

UNITED STATES AIR FORCE PROJECT RAND
This research is supported by the United States Air Force under Project Rand—Contract No. F44620-67-C-0045—Monitored by the Directorate of Operational Requirements and Development Plans, Deputy Chief of Staff, Research and Development, Hq USAF. Views or conclusions contained in this study should not be interpreted as representing the official opinion or policy of Rand or of the United States Air Force.
R-556-PR
November 1970

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A Report prepared for
UNIVERSITY OF CALIFORNIA PRESS
This Report was prepared as a contribution to Rand's broader study of the air interdiction mission. To the extent that an understanding of historical precedent is relevant to current issues, this Report attempts to fill a particular gap. There has been considerable research on past experiences in interdiction by the U.S. Air Force and Allied air forces on the western front in World War II. However, very little has been known about the role of air interdiction on the Russo-German front, and particularly about the deep interdiction experience of the Soviet Air Force, which is the topic of this study.

The term "deep interdiction," as used in this study, is a direct translation of the term used in the Soviet literature to describe operations against targets far enough behind the battle area to be distinct from operations in close support of ground forces.

The author gratefully acknowledges the comments and criticisms of Rand colleagues Arthur Alexander, Philip Dadant, Edmund Dews, and Terrell Greene.
SUMMARY

Soviet air doctrine in World War II made provision for a deep interdiction mission, defined as attacks on "enemy operational transportation and his strategic reserves," or in similar terms. However, over the war as a whole, operations of this kind accounted for only about 5 percent of all combat sorties flown by the Soviet Air Force or 168,000 sorties out of a total of about four million. Soviet historians, explicitly or implicitly, regret that more resources were not allocated to the interdiction mission, a fact that they attribute to the limited number of bomber aircraft available and to the pressure to use them in direct support of the ground forces.

Nevertheless, in 1943 and 1944, several fairly large interdiction campaigns were launched. Some of these are briefly described in this Report. (Soviet sources are generally unspecific and noncommittal as to the results achieved.)

In part, the modest scale of aerial interdiction operations may be explained by the fact that there was intensive interdiction activity on the ground. In the early phase of the war, when Soviet ground forces were retreating, they carried out systematic and widespread demolitions and evacuation of rail and road facilities. In the latter phases, partisan forces organized in the German rear were engaged in extensive demolition and sabotage activities against German lines of communications. Their activities not only hampered German logistics but also compelled the Germans to tie up considerable forces in anti-partisan operations and in guarding railroad facilities.

On the whole, there is no indication, possibly with the prominent exception of Stalingrad, that any major German defeat was primarily attributable to denial of troop reinforcements and replacements or of supplies, either by air interdiction or partisan activities.
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I. INTRODUCTION

This study examines the role played by aerial interdiction in Soviet air operations against the Germans from 1941 to 1945. It is based almost entirely on Soviet sources published in recent years, particularly those occasioned by the fiftieth anniversaries of the October 1917 revolution and the establishment of the Soviet armed forces in 1918. The principal sources used are in the nature of "official histories" and published in a manner emphasizing their authoritative status. Thus, authorship of Reference 1, a history of the tactical air forces in 1941-1945, is attributed to an "Editorial Commission" and an "Authors' Collective." The former consisted of 24 members, all of them present or retired ranking air force general officers, headed by Marshal of Aviation S. I. Rudenko, currently Commander in Chief of the Soviet Air Force. The "Authors' Collective" (for a relatively short book of 450 pages) had 24 members and 11 "consultants." With few exceptions, it was made up of active or retired air force colonels.

Apart from the aura of authority provided by this formidable array of editors and authors, many source references in the book are to materials in the archives of the Ministry of Defense or other archives, indicating that hitherto unpublished matter of an official nature has surfaced in this book for the first time.

Other publications drawn on by this study are attributed to similar, if less numerous, galaxies of "editors" and authors. Thus, Reference 5, devoted to the fiftieth anniversary of the armed forces, had an "Editorial Commission" chaired by M. V. Zakharov, currently Chief of Staff of the Armed Forces. Its members include some of the most outstanding active or retired Soviet military leaders, including Marshals Bagramian, Batitskii, Vershinin, Konev, Krylov, Rokossovskii, Sokolovskii and Admiral Gorshkov. General Epishev, Chief of the Political Directorate of the armed forces, served as deputy chairman of the Commission.
The question necessarily arises whether such high-level sponsorship and authorship enhances the quality and credibility of these works and particularly of the quantitative data contained in them. No general answer to this question is required in the context of the present study. The Soviet data used herein are generally noncontroversial, and there is no visible reason why they should be distorted or falsified. The same claim cannot be made for other data appearing in the same body of literature. For example, Soviet statistics on German aircraft destroyed are undoubtedly grossly exaggerated, and Soviet aircraft losses are played down. In any event, the data appearing in the sources and used in this study are probably accepted as true by the Soviet authors and editors, and -- except for some checking for internal consistency -- we have no way of evaluating their accuracy.
II. DISTRIBUTION OF SORTIES BY MISSION

THE WAR AS A WHOLE

Summing up Soviet Air Force experience in 1941 to 1945, an official history declares:

The war years fully revealed the capabilities of our air forces as an independent branch of the armed forces. The main efforts of aviation were aimed at three basic objectives: the struggle for air superiority, support of ground and naval forces, and aerial reconnaissance. Besides its operations on behalf of the ground forces our aviation systematically inflicted blows on administrative-political and military objectives deep in the enemy's rear, and also kept up a struggle against railroad movements and strategic reserves of the enemy [1, pp. 437-38].

Statistics supporting this statement clearly indicate that the two first-named missions -- air superiority and close support -- absorbed the great bulk of the Soviet air effort. All elements of the Soviet air forces [2, p. 424]¹ -- Military Air Forces of the Red Army (VVS or front aviation),² Long Range Aviation (ADD), interior air defense (PVO Strany), Naval Aviation (VVS VMF), and the civil air fleet (GVF) -- flew about 4,000,000 operational sorties. Of the total, the VVS and ADD accounted for 3,124,000 combat sorties. Of this figure, 35 percent were recorded as air superiority sorties [1, p. 438], and 46.5 percent were in direct support of ground forces. Air reconnaissance contributed 11 percent. Only 168,000 sorties, or 5.4 percent, were flown by VVS and ADD against "enemy operational transportation movements and reserves." Commenting on the modest scale of this latter effort, our source points out:

In 1941-1945, Soviet VVS acquired some experience in organizing and executing the struggle against the enemy's operational transport movements and enemy reserves. In

¹See the Appendix for a glossary of Soviet Air Force components.  
²As used herein, "front aviation" refers to tactical air units assigned to Fronts, which are Army groups.
several instances, the battle against reserves was waged by several air armies simultaneously, and with ADD participation.

On the whole, however, the activity of Soviet aviation against operational movements and enemy reserves was carried out by weak forces, due to the limited numbers of bomber aircraft available, and their employment mainly in direct support of the ground forces [1, p. 443].

Forty-three percent of all ADD sorties, "due to the shortage of tactical bombers" [1, p. 442], were expended in the close air support role.

Another recent history of Soviet military aviation catalogs in somewhat greater detail the targets and purposes of operations "in the deep rear" of the enemy:

Soviet aviation operated effectively against enemy reserves, lines of communication and objectives in the deep rear of the enemy, striking blows at railroad junctions, stations, bridges, concentrations of trains, and motor vehicle columns. Soviet airmen disrupted enemy plans for concentrating forces and preparations of enemy troops for ground operations [2, p. 268].

A crude breakdown of sorties by missions and air force components is presented in Table 1. It reconciles, more or less, the VVS and ADD claims of having flown 3,124,000 sorties with the total of about 4,000,000 sorties given by another source.1

It should be noted that Naval Aviation, especially in the early period of the war, was employed to a large extent in ground force support of littoral battlefields. This was strictly improvisation. As one source points out, "Naval Aviation, whose crews...were not specially trained before the war in operations over the land front, in effect was turned into 'front aviation' in 1941" [2, p. 227].

1 All published Soviet statistics on numbers and allocations of sorties suffer from lack of precise definition of the various missions. For instance, the distinction between "air superiority" and "close support" sorties remains undefined. Thus, it is impossible to answer questions such as whether fighter escorts covering close support attacks fall in the air superiority or the close support category.
### Table 1

**ACCOUNTING FOR THE ESTIMATES OF "4,000,000 SORTIES"**

<table>
<thead>
<tr>
<th></th>
<th>Sorties</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. VVS and ADD, total:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close air support</td>
<td>3,124,000</td>
<td>100</td>
</tr>
<tr>
<td>Air superiority</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Reconnaissance</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>&quot;Deep interdiction&quot;</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Balance: &quot;strategic operations&quot; (?)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>3,124,000</td>
<td>100</td>
</tr>
</tbody>
</table>

**II. Other Soviet aviation components and missions:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Sorties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partisan support (VVS, ADD, GVF)</td>
<td>109,000</td>
</tr>
<tr>
<td>PVO Strany</td>
<td>269,000</td>
</tr>
<tr>
<td>Naval Aviation</td>
<td>350,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>728,000</td>
</tr>
</tbody>
</table>

**TOTAL** 3,852,000

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**Sources:**
- VVS and ADD total, sources as indicated in text, see pp. 3-4.
- Partisan support, Ref. 1, p. 444.
- PVO Strany, Ref. 3, p. 329.
- Naval Aviation, Ref. 2, p. 298.
In later years, as VVS tactical aviation expanded, Naval Aviation increasingly returned to its "coastal command" mission. This mission, of course, included interdiction operations of a different kind, that is, attacks on German supply and troop shipping along the Norwegian coast, and in the Baltic and Black Seas.

A goodly portion of the sorties attributed to PVO Strany aviation probably was also accounted for by "front" employment rather than its assigned primary mission of continental interior (ZI) air defense. This was especially true in the critical stages of the early war period, when PVO interceptor units assigned to the defense of Moscow and Leningrad were used in close support of the ground forces and in the air superiority contest over the battlefields. Later in the war, when the Luftwaffe was no longer in a position to threaten interior Soviet cities, many PVO units, again, were drafted into the air armies of several fronts.\(^1\)

The published total of 109,000 sorties in support of partisans and agents behind the German lines (as compared with the 168,000 "deep interdiction" sorties) calls attention to the fact (to be discussed below) that partisan forces played an important part in deep interdiction since one of their primary missions was to demolish or sabotage railroads in the German rear.

The above excerpts indicate that the Soviet Air Force had a well-defined concept of deep interdiction operations. The emphasis evidently was on disrupting troop movements and interfering with the bringing up of enemy reinforcements, by attacks on railroad and road facilities, as well as on moving equipment. Supply denial -- although implicit as a by-product in operations of this kind -- is not mentioned as a specific objective, except in special cases such as the "aerial blockade" that defeated the German attempt to sustain by airlift the German force encircled in Stalingrad.\(^2\)

\(^1\)There is no indication whether the sorties flown by PVO units assigned to Front Air Armies were recorded as PVO or as VVS sorties. The latter seems more likely.

\(^2\)See Section IV below.
The sources quoted concede explicitly and implicitly that the allocation of forces to this type of operation was less than it would have been if the demand for close support of the ground forces had been less pressing, and if more bombers had been available.

**SORTIE DISTRIBUTION BY PERIODS**

By long-standing convention, Soviet historiography divides the Russo-German War into three periods (see Table 2):

**Period I** runs from June 22, 1941 to November 18, 1942. In this period, the Soviet Armed Forces suffered their disastrous defeats and territorial losses. The successful defense of Moscow and the subsequent winter counteroffensive still left the strategic initiative with the Germans, which they exploited in the 1942 offensives toward Stalingrad and into the Caucasus. November 18, 1942 marked the launching of the Soviet counteroffensive that led to the encirclement and ultimate surrender of the German 6th Army in Stalingrad -- a decisive turning point in the war.

**Period II** covers operations from November 19, 1942 to the end of 1943. It was marked by the passing of the strategic initiative to the Soviets, after the decisive repulse of the last German summer offensive against the Kursk salient, followed by a series of highly successful Soviet offensives which recaptured nearly two-thirds of Soviet territory seized by the Germans. In the summer of 1943, after an intensive air campaign against German airfields, the Soviets claim to have gained "strategic air superiority," which was retained until the end of the war, except in some local situations.

**Period III**, January 1944 to May 1945, was marked by increasing Soviet superiority in men and materiel, translated into the series of formidable offensives that finally took the Soviets to Berlin in April 1945.
Table 2
AIR ACTIVITY BY PERIODS\textsuperscript{a}

<table>
<thead>
<tr>
<th>Period</th>
<th>Total Sorties</th>
<th>Approximate Duration (months)</th>
<th>Sorties per Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>858,000\textsuperscript{b}</td>
<td>17</td>
<td>51,000</td>
</tr>
<tr>
<td>II</td>
<td>796,000</td>
<td>13</td>
<td>61,000</td>
</tr>
<tr>
<td>III</td>
<td>1,470,000</td>
<td>16</td>
<td>92,000</td>
</tr>
<tr>
<td>Total\textsuperscript{c}</td>
<td>3,124,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
\textsuperscript{a}Published sortie statistics for the three periods are less complete than those for the war as a whole. However, there are data on combat sorties flown by the VVS and ADD [1, pp. 118, 214, 415].

\textsuperscript{b}57,000 by ADD, which dropped 55,000 tons of bombs out of a total of 170,000 tons.

\textsuperscript{c}Agrees with published total (for war as a whole, see text, p. 3).
In Period I, of the 803,000 sorties flown by VVS,\(^1\) 184,686 fighter sorties were to provide cover for ground forces and aerodromes and other important rear targets, 69,397 were flown as escorts for other types of aircraft (that is, presumably bombers and Shturmovik attack planes), and 22,851 were aimed at German airfields. The total for fighter sorties, 276,934 or about one-third of the VVS total effort, was thus devoted to the "struggle for air superiority" -- a somewhat inappropriate term in this period when air superiority was overwhelmingly on the side of the Luftwaffe. The balance of the 526,066 VVS sorties (as well as probably the bulk of ADD sorties) represents mainly close support of the ground forces plus reconnaissance missions, partisan support operations,\(^2\) and occasional interdiction operations.

As to the latter:

During the first war period some experience was gained in air attacks on "operational" reserves of the enemy. In some cases they developed into major air campaigns. Thus, for instance, the operations of "front aviation" and ADD against the enemy's 2nd Panzer Group in 1941 provided important support for the ground forces by inflicting significant casualties and slowing down the offensive of the tank formations. However, the difficult air situation and the essential need for concentrating nearly all aviation forces on direct support of the ground forces on the battlefield restricted opportunities for air attacks against enemy "operational" reserves [1, p. 124].

Period II, again, was characterized by the concentration of Soviet air power on close support and air superiority operations; 796,000 sorties were flown by VVS and ADD. The air superiority battle -- given the gradual attrition of Luftwaffe strength and the rapid

\(^1\)There is a minor discrepancy in the source: 57,000 sorties of the total of 858,000 are said to have been flown by ADD (see above) which should have left the VVS with 801,000 and not 803,000 sorties, as stated in [1, p. 118].

\(^2\)In the first 18 months of war, 58,000 sorties in support of partisan forces are reported [1, p. 123]. ADD and GVF aircraft are said to have been prominent in this mission.
quantitative and qualitative growth of the VVS -- began to pay off. "Strategic air superiority" is said to have been achieved in summer 1943, after heavy losses had been inflicted on the Luftwaffe in the large-scale air fighting in the Northern Caucasus (Kuban') and the Kursk-Orel operations in July-August 1943 [1, p. 215].

Soviet historians maintain that more attention was now given to deep interdiction attacks. The volume of VVS operations against German-held railroad junctions, depots, bridges, river crossings, ports and shipping almost doubled that of similar operations in Period I [1, pp. 214, 218]. This claim probably does not amount to very much, as activity against these types of targets in Period I must have been on a very modest scale.

In Period II, Long Range Aviation is claimed to have intensified deep interdiction activity, while continuing in its close-support role:

ADD carried out independent missions aimed at disruption of railroad movements and destruction of war industry targets in the enemy's deep rear. Cooperating with ground forces, it attacked airfields, major headquarters, concentrations of reserves, fortifications, supply depots, and bridges. [1, p. 215].

Although such efforts may have been stepped up in the course of 1943, their scale must have remained very limited. This is indicated by the fact, mentioned before, that in the final count for the war as a whole, missions of this type accounted for only 5 percent of total sorties flown.

There is also interesting evidence to show that Soviet General Headquarters (Stavka), around the middle of 1943, became dissatisfied with the failure of the air forces to engage on a larger scale in transportation interdiction. On May 4, 1943 Stalin himself intervened with an order to step up operations of this kind. As the official war history has it:
In the period of preparation for the decisive summer battles of 1943, GHQ (Stavka VGK) called for intensification of the struggle against railroad and truck transportation movements in the enemy's rear, in an attempt to disorganize the concentration of his forces. An order by the People's Commissar of Defense, I. V. Stalin, on May 4, 1943 stated: "Strikes at trains and attacks on automobile columns...must be regarded as most important tasks of our Air Forces." In compliance with this order the Air Force Command organized systematic attacks on enemy communications, destroying the reserves being brought up. In the enemy rear, 250 and more kilometers from the front line, the blows were struck by our Long Range Aviation, which carried out more than 7.5 thousand sorties in April to June. Their targets were railroad junctions, stations, and accumulations of military trains. Over a depth from the front line of up to 200-250 kilometers the attack was waged by front aviation, which destroyed mainly enemy trains, motor columns, and bridges. Enemy LOC's were attacked over a broad zone, utilizing the aviation resources of the Western, Briansk, Central, Voronezh, South Western and Southern Fronts [organized Army groups]. As a rule, each Air Army specially assigned one shturmovik [ground attack] regiment and one fighter regiment, which - operating by the "free hunt" method - destroyed locomotives, trains, motor vehicles. The "hunter" groups were formed from the most experienced pilots, trained to a high standard of flying, bombing, and firing, and familiar with the area of operations. Each railroad sector [napravljenie] was assigned a permanent "hunting group" made up of two to four aircraft. As a result, the pilots were able quickly to study the pattern of enemy train movements, the local terrain, A.A. defenses on each railroad sector, and successfully to wage the struggle against enemy rail movements [4, p. 397].

It should be noted that the response to Stalin's order was not exactly overwhelming. Each of, apparently, six Front Air Armies assigned two regiments to the interdiction campaign (or some 480 aircraft at most) out of the 9 to 12 fighter and shturmovik regiments available in each contributing Air Army. 1

There are no specific claims as to what this campaign accomplished. Also, in apparent contradiction to the Stavka's order to assign a

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1 The statutory aircraft strength of an air regiment fluctuated in the early war period; in 1943 it was increased to 40 aircraft per regiment [5, p. 337].
higher priority to attacks on German LOC's, Stavka itself, at about the same time, became concerned over the need to stock up supplies for the land battles ahead, with aviation gasoline as a particularly critical item. "In order to build up [sufficient] aviation gasoline stocks, it became necessary temporarily to suspend even operations against enemy airfields and lines of communications" [6, p. 64].

The official history of the VVS, without mentioning the Stalin order to step up the rail and road interdiction campaign, describes it as follows:

During the preparation for these operations [that is, the Kursk-Orel battles], much attention was given to the disruption of rail and road enemy movements. The main enemy lines of communication, for nearly three months, were subjected to air attacks along a broad front and to a depth of 200-250 kilometers from the front line. These operations were mainly carried out by ADD units, but also by the Front Air Armies. Thus, the 16th and 2nd Air Armies alone carried out 1,909 sorties, destroying six railroad trains, about 260 loaded cars, seven locomotives, more than 120 motor vehicles, and causing more than 90 explosions and some 220 outbreaks of fire at railroad stations [1, p. 177].

Apart from the campaign against German rail and road transportation, the prolonged lull in the land battle prior to the German Kursk offensive apparently enabled the VVS to devote more attention than usual to other targets in the German rear.

Soviet VVS operated against enemy troops in their concentration areas, against command posts, communication facilities, and depots. 7,987 sorties were flown against such targets. The attacks were mounted after thorough aerial reconnaissance and were very effective. Thus, early in May a group of fifty Pe-2 bombers of the 16th Air Army, attacking in the vicinity of the Brasovo station and the town of Lokot, exploded a large ammunition dump, destroyed several tanks and armored cars, and smashed a train carrying military freight [1, p. 177].

In the third and last war period, the VVS-ADD total effort of 1,470,000 sorties evidently was quite predominantly devoted to

1 Assigned respectively, to the Central and Voronezh Fronts.
2 In December 1944, ADD was merged with VVS, as the 18th Air Army.
cooperation with ground forces in the several large-scale Soviet offensives. Although the Soviet Air Force enjoyed a vast numerical superiority over the Luftwaffe:

The struggle for retention of superiority in the air remained one of the basic tasks of Soviet aviation. Experience in the two preceding periods had shown that air superiority is a primary condition of success of the ground forces and their offensive operations [1, p. 416].

At the same time, the interdiction mission is claimed to have received more attention than before:

In 1944-1945, Front and Long-Range aviation expanded the struggle against "operational" transport movements and enemy reserves. This contributed to widening the scope of offensive operations on the ground. Aviation periodically disrupted enemy transportation movements (Belorussian operation), destroyed troops moving towards the battlefield on highways (Lvov-Sandomir operation), and pinned down and destroyed enemy reserves in their area of concentration (Lodz, Kielce) [1, p. 419].
III. SPECIFIC INTERDICTION CAMPAIGNS

Given the modest role played by interdiction operations in the total Soviet air effort, descriptions of this type of operation are relatively few and sketchy. However, they do provide some notion of the strategic context, objectives, and tactics of the major interdiction campaigns.

A selection of such accounts is presented here, more or less in chronological order, with a minimum of comment.


The targets mentioned were far in the rear of the front line, over 300 kilometers in the case of Vitebsk and Smolensk:

Late in December 1941 air reconnaissance had observed concentrations of trains at the railroad junctions in Minsk, Polotsk, Vitebsk, Orsha, Smolensk, Viazma and Rzhev. The fascist command was hastily transferring fresh forces from its deep rear, in order to stem our offensive. By orders from Stavka, our long-range bombers operated against these rail junctions on fifteen successive nights. More than 30 trains carrying troops were blown up or set on fire. Railroad tracks were destroyed at many points.

2. Moscow Counteroffensive, January 1942 [7, p. 325]:

The roads attacked (except for the Warsaw-Minsk highway) run in a north-south direction, roughly parallel to the front line and at a distance from it of 100-200 kilometers:

Long Range Aviation was attacking enemy rail and road lines of communications, mainly on the roads Viazma-Orsha, Rzhev-Viazma-Briansk, Sukhinichi-Elma; and also the Warsaw-Minsk highway.

3. Lull Prior to Kursk Battles, May 1943 [2, p. 153]:

ADD at this time was continuing its independent mission of disrupting "operational" and strategic rail movements of the enemy, in order to delay the regrouping of his forces. Its systematic strikes not only reduced the volume of such movements but also inflicted heavy casualties and losses in combat materiel.
Thus, on the night of May 3, 1943, the railroad junction at Minsk, through which passed trains from Germany and Poland, was attacked by 109 long-range bombers. They destroyed the freight and passenger stations, the locomotive depot, and the power plant. They also destroyed three troop trains and exploded an ammunition depot.


Hoping to avoid a total rout the fascist command hurriedly began to move armored and motorized divisions from the Donbass and other areas to the Bogodukhovo and Akhtyrka region, with the intention of mounting a counter-strike at the flank of the Voronezh Front. Our air reconnaissance soon discovered these large movements in the enemy rear. Vigorous counter-measures were taken promptly. The enemy troops, moving by rail and by road, were attacked by front aviation and units of long-range bombers.

The 8th Air Army of the Southern Front was the first to go into action. Flying as many as 400-500 sorties daily, it carried out continuous attacks on the enemy tank and motor vehicle columns moving in the Kharkov direction.

Three more Air Armies joined in the campaign and attacked trains at the railroad stations of Gorlovka, Slaviansk, Barvenkovo, and Pavlograd. They also struck at motor vehicle columns on the roads. At the same time, two air corps of ADD attacked concentrations of German trains at the stations and junctions of Poltava, Liubotin, Krasnoarmeiskoe, Krasnograd, Merefa, and others.

As a result of the combined efforts of front and long range aviation, the enemy's troop movement was slowed down and suffered heavy casualties [2, p. 165].

Later in 1943 (October), during the offensive that took the Soviet army to the Dnepr River, ADD again was engaged in bombing major railroad junctions (Konotop, Bakhmach, Nezhin, Krasnograd, and others) [2, p. 171].

5. Soviet 1943/1944 Winter Offensive on Leningrad Front [2, p.]:

On the night of January 26, 227 long-range bombers attacked the railroad stations at Siverska and Volosova. Dropping 243 tons of bombs, the Soviet airmen inflicted great damage on the enemy and put the railroad stations
out of action. The movement of troops by rail from the Narva and Luga sectors ceased.

Early in February, Hitler's High Command started to move reserves from Pskov to the front, intending to disrupt our offensive by counter-attacks. These troop movements were observed in time by our air reconnaissance. The enemy columns...were subjected to crushing blows by airmen of the 13th Air Army. On the roads leading from Pskov to the east and northeast, from January 6 to 11, they destroyed about 200 troop-carrying trucks, 250 loaded carts, 20 guns, two infantry battalions, and 134 railroad cars. The enemy forces preparing for the counter-attack were weakened.


Long Range Aviation, apart from cooperation with advancing ground troops, carried out raids on war industry targets and enemy-held ports. In February, it repeatedly bombed troop concentrations in the ports of Kotka and Turku, as well as war industry targets in Helsinki. These raids, carried out by 400 to 900 bombers, speeded up the withdrawal of Finland from the war.

At the same time, ADD was disrupting enemy movements by rail. On the night of February 19, 1944, 380 long-range bombers struck at the Pskov railroad junctions, dropping on it 4,000 bombs weighing 547 tons. Many fires were started: troop trains, supply depots and station buildings were left afire, and tanks containing POL were blown up.

7. Planning for Summer 1944 Offensive Against Army Group Center [2, p. 187]:

An important role in the forthcoming operation was assigned to aviation. The tasks set for front and long-range aviation were: firmly to retain air superiority; to support the ground forces during the break-through of enemy defenses, the encirclement and destruction of the enemy groups at Vitebsk and Bobruisk, and also the encirclement and destruction of the main forces of Army Group Center west of Minsk; to interdict (vospredit') the movement of enemy reserves toward the battlefield, and to disorganize the westward retreat of enemy troops; finally, to conduct continuous aerial reconnaissance.
8. **Offensive Against Army Group Center, July 1944** [2, p. 190]:

Aviation...was to disrupt the planned retreat of the enemy and to interdict the forward movement of his reserves. Bombers of the 3rd, 1st and 16th Air Armies, and also ADD...struck at the railroad junctions and stations at Daugavpils, Molodechno, Minsk, Negorelo, Baranovichi, Lutinets. As a result of these operations, totaling about 4,000 sorties, rail traffic was paralyzed. Enemy reserves, after suffering heavy casualties, were late in reaching the front, and had to be committed piecemeal.


Once again the tasks assigned to aviation included "interdiction of the forward movement of fresh enemy reserves." To this end,

Bomber aircraft operated against railroad junctions and stations, bridges and fords, creating bottlenecks and destroying concentrations of trains carrying troops and military equipment.

One episode in this campaign was the "isolation of Lodz":

Air reconnaissance had ascertained that enemy troop trains were continuously passing through Lodz. The 241st Bomber Division was ordered to stop rail movement through this junction. They destroyed the tracks at the inbound and outbound switch points and almost totally put this junction out of action. When Lodz was captured by tank troops, they seized 400 cars loaded with military equipment and supplies, as well as 28 intact locomotives.
IV. STALINGRAD: A SPECIAL CASE

Soviet aerial interdiction efforts were generally directed against targets on the ground (and, in a minor way, on water) but there was an important case of a campaign aimed at interdicting airborne supply. This was the successful Soviet effort to frustrate the German plan to airlift supplies to the German 6th Army encircled in Stalingrad to enable it to withstand a prolonged siege.

The Stalingrad pocket was created when the two prongs of a Soviet offensive, launched November 18, 1942, joined up on November 23, cutting off some 400,000 German and Rumanian troops engaged in the battle for Stalingrad, which had been ranging since August. German efforts to relieve the 6th Army were unsuccessful. General Friedrich Paulus, the commander, had delayed a break-out attempt until it had become infeasible. In addition, he was under increasing pressure from Hitler to hold out and neither to break out nor capitulate.

According to a German historian, Kurt von Tippelskirch [4, pp. 247-49], the German command, by this time, had developed excessive confidence in air supply, both of forces encircled on the ground and forces on the offensive that had outpaced normal supply channels. The main precedent for successful airlift operations had been the relief of the six divisions trapped in the Demiansk pocket (southeast of Leningrad) from February to April 1942. In this case the Luftwaffe had succeeded in delivering 200 tons of supplies daily, enough for the minimum requirements of the encircled force. According to von Tippelskirch, "Successful air supply of the Demiansk pocket served as a temptation to repeat the experiment under entirely different conditions at Stalingrad."

For Stalingrad, the 6th Army estimated its minimum supply requirements at 750 tons daily. Luftwaffe experts held that about 300 tons would be feasible "if the front was stabilized close to Stalingrad" [13, pp. 312 ff.]. At this point, on November 24, Hermann Goering reportedly "promised" Hitler that the Luftwaffe would be capable of delivering 500 tons daily, and the airlift got under way.
The Luftwaffe had 298 transport aircraft available, and estimated that 500 would be needed for delivering 300 tons daily [14, pp. 424 ff]. Heinkel-111 and other medium bombers were used to supplement the JU-52 transports.

Initially, conditions were relatively favorable. There were still several usable airfields in the Stalingrad pocket. Only one of them (Pitomnik), however, was out of range of Soviet artillery. The main German bases for the airlift, Tatinskaia and Morozovaia, were only some 200 kilometers from Stalingrad. In favorable weather -- of which there was little -- the JU-52 transports were capable of two to three round trips daily, flying in groups of 30 to 40 with fighter escorts. Even so, supply deliveries fell short of minimum requirements. The actual tonnage delivered averaged barely 100 tons. Attrition was heavy: 246 aircraft were lost in December alone [13, p. 318].

The difficulties of the airlift increased steadily as Soviet ground operations compressed the perimeter of the Stalingrad pocket, successively capturing the airfields available to the Germans for receiving airborne supplies. The most important main base, Tatinskaia, was captured by Soviet tanks on December 24, where they allegedly put out of action 350 German aircraft on the ground and destroyed the vast supply dumps accumulated there by the Germans [1, p. 144]. Thus, the Soviet westbound advance forced the Germans to relocate the airlift bases farther and farther from Stalingrad. Paulus' 6th Army had been literally starved out when its remnants capitulated on February 2, 1943.

Soviet accounts of their antiairlift operations are somewhat sketchy. They assert that their Air Force imposed an effective "aerial blockade" of Stalingrad. This apparently consisted of:

a. Interception and destruction of German transport aircraft in the air;

b. Continuous air attacks on German airfields in the pocket;
c. Bombing of the German airlift bases. The "aerial blockade" is said to have "essentially realized its objectives," and it is claimed that in air battles and attacks on airfields 1,200 enemy aircraft were destroyed. Eighty percent of these were transports and bombers [1, p. 147].
V. ALTERNATIVES TO AERIAL INTERDICTION

It will be seen from the discussion in Section III that Soviet efforts at deep interdiction were quite predominantly focused on railroad targets. Given the heavy dependence of both sides on rail transportation, in the absence of a well-developed road network in Russia, this concentration was not surprising. It should also be noted that all the interdiction campaigns described earlier were mounted in conjunction with major Soviet offensives. With one exception only -- the 1941-42 winter campaign -- they occurred in War periods II and III, when Soviet forces had gained strategic ascendancy over the Germans. Soviet sources acknowledge very few air interdiction operations in the early war period, when the ground forces were in retreat or on the defensive.

Although they attribute this fact to the pressing need of the ground forces for ground support, there were additional forces at work that probably reduced the need for allocating air forces to interdiction campaigns.

One was the very large-scale and systematic demolition of rail facilities during Soviet retreats in 1941 and 1942. The other was the inefficiency of German railroad operations, at least in the early phase of the war. A scathing description of the latter problem was provided by the memoirs of Field Marshal Wilhelm Keitel [8, pp. 176-177]:

The railway transport system was never really equal to the needs of the armed forces or a war economy, despite the fact that the German Reich Railways not only expended vast quantities of material on modernization but also put its best railway engineers and directors to work on the system. The railway's performance during the winter of 1941-1942 can only be termed disastrous; from December 1941 to March 1942 it grew so critical that only the establishment of a special motor transport organization staved off the complete collapse of the vital supply system for our troops.... The situation demanded the adoption of special measures, particularly for the protection of the locomotives and of their water-tanking stations which were totally unsuitable for the sub-zero temperatures of the unusually cold spell. There were days when as many as a hundred locomotives broke down; German locomotives were just not designed for a climate like that;
we had been forced to re-bed all the railways to the standard German gauge, because virtually no Russian rolling stock had fallen into our hands....

To relieve this situation, Hitler transferred the responsibility for running all railroads in Russia from the military authorities to the Reich Transport Minister and the civilian Reichsbahn organization. This solution had some useful effect. However, Keitel claims that serious bottlenecks continued:

The Army by itself [that is, not including the Air Force] had a requirement for 120 trainloads of supplies every twenty-four hours, assuming that no particular operations were in hand demanding increased munitions supplies and hospital transport, but with a supreme effort, the railway's carrying capacity could be brought up finally to only one hundred trains a day and that for only brief periods. Besides, there were violent fluctuations which could be attributed to the endless stoppages caused by the partisans; often, there were more than a hundred stretches of railway line blown up in one night.

Keitel's severe judgment of German railroad operations in Russia may not be entirely fair, as they had to cope with the truly formidable problem of demolitions and evacuation of rolling stock carried out by the Soviet Railroad Troops, an organization specially trained and equipped for both demolition and reconstruction of rail facilities. One source summarizes their activity in the early period of the war as follows [5, p. 328].

During the defensive operations of the Red Army, they evacuated into the country's interior rails, locomotives, cars, communication equipment and other facilities. Where evacuation was not possible, the railroad troops demolished tracks, bridges and other railroad equipment. All this made it more difficult for the enemy to make use of railroads and slowed down his advance.¹

By far the most important and widespread method of railroad interdiction was the action of partisan forces against German railroad

¹A detailed account of the destructive and constructive activities of the Soviet Railroad Troops will be found in K. P. Terekhin et al., Voiny stalnykh magistralei (The Warriors of the Steel Highways), Moscow, 1969.
transportation in occupied Russia. It is beyond the scope of this study to present a detailed account of the partisan organization and its activities. However, it should be noted that from 1942 on, and on an increasing scale until the expulsion of the Germans from Russia, the partisans -- under close direction from the Soviet High Command and the "Front" commands -- engaged in a systematic campaign aimed at disrupting German rail transportation. This they did by derailing or blowing up moving trains (allegedly they caused 18,000 train wrecks during the war as a whole) [9, p. 231], by blowing up rail lines, bridges and culverts, disrupting signaling and communication facilities, and so forth.

Soviet sources are replete with unverifiable accounts of individual partisan exploits along these lines. However, there is sufficient evidence from German sources to indicate that partisan operations presented them with a chronic and severe problem. Apart from direct effects on rail traffic, the partisan threat compelled the Germans to tie up large forces to guard their LOC, and to conduct anti-partisan operations. According to one Soviet claim, in summer and fall 1942, the Germans had committed 22-24 divisions to anti-partisan operations, of which 15 or 16 were on permanent guard on railroads [7, pp. 485-86].

Due to the effective communications between the partisan leaders and Soviet army commands, a high degree of coordination of partisan activities with Red Army operations was achieved. This mainly took the form of greatly intensified partisan activities against German LOC on the eve of, or during, major Soviet offensives. Such surges in partisan operations first occurred in 1943, mainly during the months preceding the Kursk-Orel battles. Apparently the biggest and most effective campaign of this kind was staged before the Soviet summer offensive against the German Army Group Center in 1944. An expert German witness, Hermann Teske, who was Chief of Transportation in Army Group Center at that time, describes this incident as follows:

Twenty-four hours before the Russian offensive, on the night of June 19, 1944, the partisans carried out their biggest operation yet. 10,500 explosions were counted in a single night, equivalent to two-thirds the total of
explosions during the entire month of May. In addition, 3,500 explosive charges were found and removed (compared to 7,000 in May). The consequence was an almost total interruption of all traffic for 24 hours or more. Material damage was so great that in the crash repair program immediately undertaken, it was often necessary to dismantle second tracks and use the rails to restore at least single-track operation [10, p. 218].

It is interesting to note that Teske's book devotes much more attention to partisan operations and their effects on railroad movements than it does to Soviet air attacks on rail targets. He does occasionally acknowledge effective Soviet coordination of both types of attack. Thus, discussing the German buildup for the Kursk-Orel offensive in spring, 1943, he writes:

The Russian leadership acted very sensibly in employing its forces to impede lines of communication in the German rear: it used night bomber attacks against lines close to the German front, and Partisan operations against those farther in the German rear [10, p. 180].

On a few occasions Teske pays tribute to Soviet planning of air attacks on railroads. Thus:

The Smolensk-Briansk railroad, in the middle of March [1943] was subject to Russian air attacks almost nightly. They varied their targets skillfully, indicating good cooperation between Soviet transportation authorities and the Red air force: a cooperation that was never achieved in the German Wehrmacht. ...For instance, one day Russian airmen attacked the railroad repair depots in Roslavl' in order to prevent speedy repairs of damaged rolling stock. The next night they attacked all stations along a 60 kilometer stretch of the Smolensk-Roslavl' line and destroyed their means of communication. This was a form of damage more enduring than many rail cuts, as the capacity of a vulnerable rail line depends primarily on a well functioning communication system. On the third night, they attacked an ammunition depot in Briansk, which, of course, must have been well known to them. Besides destroying the depot, the attack resulted in secondary explosions which went on for several days, and seriously hindered the operation of the nearby railroad. So much for the interference by the Soviet air force. However, partisan activities -- even then cleverly directed from Moscow -- were at least equally important [10, pp. 180-181].
VI. CONCLUSIONS

According to the Soviet statistics reviewed above, the share of deep interdiction sorties flown was only some 5 percent of the total combat sorties dispatched by all components of the Soviet air forces during the war as a whole. The absolute number of such sorties -- some 168,000 -- appears puny if compared with the formidable numbers of sorties launched in the name of air superiority and close support of the ground forces. There is no doubt that, relatively speaking, these latter missions dominated Soviet air activity in 1941-1945. Removed from this dominating background, the deep interdiction effort looks less negligible. The 168,000 sorties spread over 1,417 days of war amounts to some 120 sorties daily. Since, of course, this effort was not evenly spread over time, but oscillated from total lulls to surges of intensive activity, one may conclude that in certain situations -- such as some of the specific campaigns reviewed above -- deep interdiction attacks played a fairly important role in total Soviet air activities.

What the deep interdiction effort accomplished is a question more difficult to answer. Soviet claims in this respect are distinctly modest, which possibly reflects equally modest and realistic expectations as to the value of this type of operation. On the other hand, several sources quoted above implicitly express regret that deep interdiction was not conducted on a larger scale, which suggests that the Soviet military historians ascribe a fairly high marginal value to interdiction operations.

Judgment on this is complicated by the fact that the Soviet air forces had land-based competitors or collaborators in the interdiction mission. As noted above, during the period of retreats and defeats in 1941, Soviet Railroad Troops performed a thorough job of demolition to impede the German advance and to make their use of the Soviet rail network as difficult as possible. In German-occupied territory this function was taken over by well-organized and centrally directed partisan troops who -- not without extensive Soviet air support across the front
lines -- wrought enough damage and disruption on the German LOCs to make the Wehrmacht's life difficult though not intolerable. There is no indication -- with the possible exception of Stalingrad -- that any major German defeat was primarily attributable to denial of reinforcements or replacements of troops or supplies by either air interdiction or partisan activity.
Appendix

GLOSSARY OF SOVIET AIR FORCE COMPONENTS

VVS: Voenno-Vozdushnye Sily Krasnoi Armii

Translated literally as "Military Air Forces of the Red Army," but usually abbreviated to VVS, this term in Soviet literature is sometimes loosely used to refer to all kinds of Soviet air forces. More correctly it refers to what is often called "frontovaia aviatsiia" (front aviation), that is, tactical air force units and formations making up, since early 1942, the "Air Armies" assigned to "Fronts" (or roughly Army Groups). Sixteen or seventeen Air Armies were formed in 1942.\(^1\) In December 1944, Long Range Aviation was demoted to the status of an Air Army, the 18th. Front aviation, numerically, was by far the largest component of the Soviet air forces.

ADD: Aviatsiia Dalnego Deistviya -- Long Range Aviation

A potentially "strategic" force, formed in March 1942 and consisting of relatively heavy and long-range, but largely obsolete, bomber units. In 1942, ADD was made up of eight Air Corps each comprising two divisions of two regiments. In mid-1944, ADD had about 1,000 aircraft [11, p. 160] and was formally subordinated directly to Stavka. Although conceptually it was supposed to be an independent "strategic" force, it was actually used as a kind of General Headquarters reserve, and was committed piecemeal, by having its units assigned to "Front" Air Armies when they were in need of reinforcements in either defensive or offensive operations. Forty-three percent of all ADD sorties were in close air support of ground forces. The balance, apparently, represented participation in the deep interdiction operations described in the text, air transport duties, and a few token attacks on East German cities and targets in Southeast Europe; including, allegedly, some attacks on the Ploesti oil fields and refineries.

\(^1\)There is ample evidence in Soviet sources on the existence and activities of Air Armies 1 through 10 and 12 through 17, but not a single mention of an 11th Air Army.
In December 1944, ADD lost its relative independence and was merged with VVS as the 18th Air Army. Allegedly, this was done to enable the ADD "to be used not only against distant targets but also for support of advancing troops and the augmentation of blows struck by front aviation" [12, p. 43]. This is a somewhat lame explanation, as throughout the war ADD had been prodigally used in the close support role. More likely, the abolition of ADD reflected a recognition that there was no long-range mission left for ADD, what with the extension of Allied strategic bombing to East Germany, Poland, and Austria, and the Soviet need for heavier bombers to help reduce fortified German strongholds, such as Koenigsberg and Breslau.


This was an integrated home air defense command that controlled interceptor units, antiaircraft artillery, and civil air defense. Initially deployed to protect major cities, it often was called upon to reinforce front aviation, both for antiaircraft protection of ground forces and close support of the latter. In contrast to ADD, PVO succeeded in maintaining its organizational identity and its direct subordination to Stavka.

VVS VMF: Vozduzhnye Vooruzhennye Sily Voennyo-Morskovo Flota -- Naval Aviation

Its prewar mission was to cooperate with the major surface fleet units, augmenting their fire power, and to facilitate their operations by providing air defense of ships and bases. It also was to be one of the elements in antiship warfare, and the basic means of maritime reconnaissance [2, p. 267]. At the outbreak of war it had (excluding units in the Far East) 1,445 combat aircraft, mostly obsolete types. Of this, interceptor aircraft accounted for 54.3 percent, reconnaissance planes for 25 percent, bombers represented 14 percent, and torpedo-carrying aircraft only 9.7 percent. After suffering heavy losses early in the war, Naval Aviation, by the end
of 1943, rebuilt its strength to 1,040 aircraft, including 123 torpedo bombers and 198 Shturmoviks, which had been found effective in attacking small vessels.

As noted in the text, Naval Aviation interceptor and bomber units were also engaged in close support of ground forces in operations close to naval bases.

GVF: Grazhdanskiy Vozdushnyi Flot (Civil Air Fleet)

On the outbreak of war, the civil air fleet, previously subordinated directly to the Council of People's Commissars, was transferred to the operational control of the People's Commissariat of Defense. All its employees were mobilized and its equipment commandeered for wartime tasks. It was reorganized into units that were assigned to the Front commands. A special "Moscow Aviation Group" remained under the control of Stavka.

The main missions of the Front units of GVF were described as follows:

Airlift of ammunition, weapons and POL for the ground forces and front aviation, maintenance of communications among the staffs of the ground forces and Air Armies, dropping or landing airborne forces, evacuation of wounded... assistance to combat activities by partisans...conduct of reconnaissance and occasional bombing over battlefields... dropping of leaflets [2, pp. 423-429].

During the war as a whole, GVF units flew 1,595,943 flights, 83,782 of them by night. Over 1.5 million personnel were carried, of whom 66,673 were landed in enemy-held territory and 44,867 were parachuted behind enemy lines.

Cargo delivered to front units totaled 122,027 tons, of which ammunition accounted for 24,998 tons, weapons and rations 76,659 tons, medicaments 1,698 tons, blood plasma 2,044 tons, and mail 15,782 tons.

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1The majority of GVF flights were not "combat sorties." Hence, this total is largely additional to the sortie statistics given in Section II.
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