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# THE SOVIET AIR FORCE AND STRATEGIC BOMBING

by

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*Abstract*

It is the purpose of this project to show why the Soviet Air Force did not embrace the revolutionary Douhetian concept of strategic bombing as did other world powers during the 1920's, 30's and World War II. It is also to explain that in addition to technological shortcomings, there was a combination of theoretical and doctrinal reasons, taken to rigidity, that was responsible for this. Moreover, to show that when the revolution in military affairs (RMA) of nuclear weapons occurred strategic bombing was adopted. Additionally, that even as strategic bombing became fundamental to Soviet strategic doctrine during the Cold War, it was not at the exclusion of a more traditional Red Air Force role.

## **Chapter 1**

### **Introduction**

Why did the Soviet Union not embrace the Douhetian theory of strategic bombing while other world powers did? Throughout the 1920's and 30's leading nations around the world not only strove to create a viable air force for utilization in future wars, but did so with an emphasis on strategic bombing. This Revolution in Military Affairs (RMA) was viewed by its advocates as something that could potentially preclude massive, protracted land campaigns and the atrocious casualties inherent therein. Breaking the bloody paradigm of Verdun, Flanders and other costly campaigns of The Great War was on the minds of such theorists as Douhet, Trenchard and Mitchell as they developed theories of strategic bombing that that would ultimately be tested in World war II. America, Great Britain, France, Italy and even Germany endeavored (to varying degrees) to create air forces capable of striking at the heartland of an opponent. In the United States this effort was manifested in the Air Corps Tactical school developing the "industrial web" theory as a practical application of strategic bombing – aimed at destroying the domestic will, infrastructure, and manufacturing capacity of an adversary.

Mainly in the European Theater of Operations (ETO) from 1942 – 1945, and under the overall direction of such men as Arnold and Portal, the U.S. Strategic Air Forces and the RAF Bomber Command put into practice, and modified, the strategic bombing

theories that had been promulgated for two decades. Under the command of such luminaries as Spaatz, Harris, Eaker, and Doolittle the credence (or lack thereof) of strategic bombing was validated. The Soviet military was a keen observer of these efforts while adhering to a different focus for their own air force. Indeed during the interwar period the Soviet Union too had been building an air force and a doctrine for its employment. They had built so called long range bombers and even used them for strikes against Berlin in 1941. But these were more token efforts at demonstrating that they could do so, than a commitment to that particular theory of warfare. Traditional Russian insecurity with regards to the Western Powers, perceived “permanent operating conditions”, technological short comings, and certain leadership deficiencies combined to give Soviet strategic bombing endeavors secondary, even negligible, importance. Only after the advent of the nuclear age (specifically by the early 1950’s) would strategic bombing become paramount to Soviet defense doctrine.

This study is focused on showing why circumstances unique to the Soviet Union caused her to disregard a strategic bombing role for her air force, until (ironically) a second RMA (the development of nuclear weapons) required it. In doing so, the study will be broken down into six parts. First, to provide context, a brief historical review of the strategic bombing theory that became significant to air forces around the world during the interwar period. Second, (and directly related to main point number one) a more detailed account of what the Soviet military in general, and the Soviet Air Force in particular was doing during this same period to develop a doctrine and organization for national defense. Third, Soviet reaction to how the Allies applied strategic bombing in the ETO from 1942-1945, and what the Soviet Air Force was doing on the Eastern Front

at this same time (this part reinforces main point one in that Soviet experience and observations during WWII reaffirmed their own decision to forsake strategic bombing). Fourth, the changes in the Soviet Union during the early 1950's that brought about a shift toward developing a strategic bombing air force (main point number two). Fifth, how by the 1970's the Soviet Air Force had largely returned to its traditional ground support role (main point number three). The sixth, and final, part will provide conclusions and analysis as to what other options or alternatives (if any) were not only feasible, but (moreover) more promising than that which was adopted in terms of Soviet air force doctrine and strategy.

## Chapter 2

### The Advent of Strategic Bombing

The attrition heavy, stalemated campaigns of The Great War caused military theorists around the world to search for ways to return maneuver to warfare and thus reduce casualties in future conflicts. While ground warriors, such as the Briton J.F.C. Fuller, saw the maneuver potential of massed armored columns of tanks as a way to achieve this end, emerging air power theorists foresaw an even more unprecedented form of warfare as being decisive in the future – strategic bombing.

One of the leading proponents of this new theory was the Italian general Giulio Douhet. Having been a member of the Italian General Staff since 1900, heavily involved in Italy's use of dirigibles in military service prior to World War I, he also commanded the lone Italian aviation battalion in 1912. As was the case with other air power pioneers his outspokenness ultimately found him falling into disfavor with the establishment – first by ordering the unauthorized construction of several Caproni Bombers in 1914 (in reaction to a dreadfully reluctant bureaucracy), then during WWI for his outspoken criticism of how the Italian government was waging war. This resulted in his court martial and dismissal from the service. In 1921 he wrote and had published *The Command of the Air*, that espoused an independent role for modern air forces. Douhet's work contended that air power was revolutionary because it operated in the "third

dimension” unhampered by land constraints. His thoughts on the optimum advantages of strategic bombing were that it afforded the ability to strike at an opponent’s “vital centers” (as opposed to the traditional view of hitting the field forces exclusively) from which the means to wage war came. Accordingly, he saw five primary target systems as critical: industry, transportation infrastructure, communication nodes, government buildings, and the will of the people. This last target was paramount to him as modern war entailed the involvement of not only a nation’s armies, but their citizenry as well. □

Another European air power advocate, and strategic bombing theorist was Great Britain’s first Chief of the Royal Air Force (RAF), 1919 – 1930, Air Chief Marshall Hugh Trenchard. Like Douhet, Trenchard had seen the atrocious cost in human life that the Great War had reaped. Also like Douhet, Trenchard felt that that harvest of unconscionable loss had been sown with the seeds of dogma. In short, those responsible for the execution of the war had adhered to outdated methods in the face of emerging technological advances. In the interwar period, Trenchard strove to redress this situation, but unlike Douhet he was operating from a position within the establishment. □ This would make his contributions to air power and strategic bombing both more conservative, and yet (from a practical standpoint) more effectual. Evidence of this can be seen in the fact that while he personally believed that bombing strikes against enemy factories, their workers, and by extension the enemy populace would be decisive in future wars, he never lost sight of the fact that the necessarily expeditionary nature of British land force involvement made it impossible to envision a British Air Force that could be totally divorced from some form of ground support role. Consequently, he saw an air campaign that would focus on what we would today call “interdiction type targets: rail yards,

bridges, supply depots, and road networks.”<sup>□</sup> Also, his official position in the RAF hierarchy made him acutely aware of the plain fact that British bombers had neither the range nor the payload (at that point in time) to be decisive alone. Yet, fundamentally he held three strong philosophical beliefs regarding air power which would influence British follow-on disciples (such as Slessor and “Bomber” Harris): “air superiority was an absolute prerequisite to military success, air power was inherently a strategic and offensive weapon, and that airpower’s psychological effects were even greater than its significant material effects”.<sup>□</sup> Those last two premises translated directly to strategic bombing. They were particularly influential in that Trenchard’s views were formalized and codified in RAF doctrinal manuals and regulations of the interwar period.<sup>□</sup>

America’s venture into the development and promulgation of strategic bombing theory can best be summarized by reviewing the efforts of Billy Mitchell and the institutional outgrowths of his endeavors. Without citing his entire career path, suffice it to say that Brigadier William “Billy” Mitchell emerged from WWI as an influential and articulate, if often vitriolic, advocate of air power in general and an independent American air force in particular. As one of the leading airmen in Pershing's American Expeditionary Force (AEF) he had held positions of increasing responsibility as Chief of Air Service at the brigade, corps, army and army group level. Early on, as senior airmen in theater at the time, he had been Chief of the Air Service, AEF. Perhaps more importantly, these positions gave him occasion to meet and relate professionally with both Trenchard, and to a lesser degree, Douhet. Following the war Mitchell’s continued outspoken advocacy of the bomber resulted in his well documented court martial and dismissal from the Army.<sup>□</sup>

More importantly, however, his efforts resulted in the forming of the Air Corps Tactical School (ACTS) and his beliefs, as expanded on there, educated the numerous young officers who would put those theories of strategic bombing into practice during WWII. It is instructive then to indicate here what airmen such as Arnold, Spaatz, Eaker, LeMay, etc. were taught (and taught) at ACTS in the 1930's regarding strategic bombing. Under the umbrella heading of "industrial web" bombing ACTS developed a theory of warfare that would utilize an independent air force whose role would be inherently strategic. As such it would focus it's main effort using long range bombers to carry the war to the heartland of an enemy an destroy his industrial capacity to wage war as well as his will to do so. Five principles were formulated accordingly: disruption or paralysis of an enemy nations reliance on major industrial and economic systems undermines both that enemy's capacity *and* (emphasis added) will to fight, bombs can be delivered with sufficient accuracy to destroy the critical points of those major systems, massed bomber strikes can penetrate enemy air defense, proper selection of those vital targets is necessary to achieve decisive victory through the air, attacking enemy population within cities (preferably not indiscriminately) may be necessary if enemy resistance persists even after successful paralysis of selected targets has been achieved. □

### Notes

□ The School of Advanced Airpower Studies, *The Paths of Heaven The Evolution of Airpower Theory* (Air University, Maxwell AFB, AL, 1997), 2-11.

□ Ibid., 41.

□ Ibid., 45.

□ Ibid., 51.

□ Ibid., 53.

□ Ibid., 79-98

□ Major H. Gwight Griffin and Others, *Air Corps Tactical School: The Untold Story* (Air University, Maxwell AFB,AL, 1995), 9-18.

## Chapter 3

### Soviet Doctrinal Development

Following the successive turmoil of the Russian Revolution, The Great War, and the Bolshevik/White Russian Civil War, the Soviet Union found itself faced with the situation where it did not have a viable military in the sense that other world powers did. Consequently, it spent the decades of the 1920's and 30's attempting to build such an entity. In seeing how this impacted formation of air force organization and doctrine in that country it is instructive to review certain aspects of that internal endeavor: attempts at creating a combined arms force, affect of early air power advocates on the embryonic Soviet Air Force, preoccupations with size (in terms of both individual aircraft and quantity), ground support versus long range bombing, the conflict between traditional ground warfare proponents and Soviet air power enthusiasts, and the effect of Stalin's purges of the officer corps on doctrinal and organizational progress.

During this interwar period Marshall M.N. Tukhachevsky was a prominent theorist and Red Army strategist who articulated their focus on the strategic defensive. Given Russia's great territorial expanse, as well as historical precedent (Napoleon's invasion in 1814), this was a prudent approach. The challenge rested in how to incorporate into that strategy the emergence of mechanization and air power.<sup>□</sup> The Red Army maneuvers of 1931-32 marked the first time that large columns of infantry were combined with

motorized and mechanized units combining tanks and artillery. By 1933 War Commissar K.E. Voroshilov was asserting that 1933 had solved the problem of integrating the tank into the mass army. The Kiev Maneuvers of 1935-36 saw the addition to this team of the tactical air force. Following those maneuvers Tukhachevsky was claiming a validation of this new combined arms approach. Unfortunately, he would not live to see the final fruition of his two decades worth of work with the Eastern Front campaigns of WWII. □

This combined arms approach, while strategically defensive, held to an offensive spirit at the operational level of war. As such it embodied a “deep attack” approach. In 1933 this was formalized with the publishing of orders entitled ”Temporary Instructions On The Organization of Deep Battle.” Crucial to this concept was the supporting role of aviation to strike at the enemy’s rear. □ A significant problem remained in that there were not sufficient numbers (nor adequate quality) of tanks or aircraft to totally integrate the entire Red Army. As was the case in other nations, leading defense establishment personalities were of the land warfare persuasion. In Russia many were of a horse cavalry background as well. This served not only to cause resistance to mechanizing a modern army, but also to resist other non-traditional forms of warfare – such as air power. While the slow acceptance of air forces as vital to prosecuting future war inched forward, vocal air power proponents existed in the U.S.S.R. as well as in Western nations. They were not satisfied with the Russian Air Force being subordinate to the Red Army. Instead they envisioned a more independent role.

Aleksandr N. Lapchinskiy, at one time Chief of Staff of the Soviet Air Force, was one of these proponents and voiced various contentions on Soviet Air power in a number of published works: *Aviation Tactics* (1931), *The Air Forces in Battle and Operations*

(1932), *Air Battle* (1934), *Bombardment Aviation* (1937), and *Air Armies* (1939, published after his execution). He consistently put forth the belief that to maximize the return on aviation employment they must: concentrate necessary air forces in sufficient numbers for a given operation, commit them to action when and where the enemy least expects it, and do so with the different types of aviation (reconnaissance, pursuit, bomber) working in close cooperation. These can be viewed as traditional principles of war being applied to the air dimension. While his later works focused more and more on the role of the bomber and an independent air force the results of battle in the air, Lapchinskiy understood the need to provide ground support. This is seen in his definition of air supremacy: “ air supremacy does not mean being able to fly a lot. Instead it means being able to with a greater sense than the enemy. This ‘sense’ is defined by the degree to which the air forces permit friendly troops to capitalize on the battle in the air ...”<sup>□</sup> This connotes the modern notion of air supremacy being a prerequisite to successful ground operations. Other strategic air force proponents included V.K. Triandafillov, General B.M. Feldman and R.P. Eidman. They represented a group of early Soviet air power enthusiasts who saw a more independent role for the Soviet Air Force as potentially decisive, and the long range bomber as key to that role.

Attempts by bomber advocates within the Soviet establishment to create a bomber-dominant force had peaked in late 1935. At that time 60% of their force were bombers. Those such as Air Chief of Staff V.V. Khripin contended that “it is impossible to wage modern warfare without conducting independent air operations.”<sup>□</sup> The mainstream Red Army leadership saw the creation of the heavy bomber force in 1936, designated TBA (*Tyazhelaya bombardirovochnaya aviatsiya*), as diverting the air force from its primary

role of ground support. □ Manifesting this school of thought was the production, in the mid-30's, of "long range", heavy bombers of the four-engine TB-3 type (designed by Tupolev). By 1939, in the wake of the purges of 1938, its production had ceased. The twin-engine SB-3 and SB-2 and DB-3 were also produced in large numbers. However, they were not long range and were designed for supporting of ground forces in a interdiction role. □ Fundamental Soviet doctrine clung to the idea of massive ground campaigns across the vast expanse of Russia as essential to the defense of the Motherland. Therefore, no strategic air force doctrine was published. □

Those interwar years produced some valuable practical validation of the Soviet Air Force in a ground support role. The Soviet-Japanese conflict of 1938-39 saw not only the successful use of the combined arms team comprised of infantry-tanks-artillery, but also with aviation operating in concert. Interdiction-type strikes into the enemy rear were tested in Manchuria and essential to the victorious battle in Mongolia (under Zhukov).

By the late 1930s, just prior to and even following Stalin's purge of 1938, we see a Soviet Air Force that was welded inseparably to its subordinate role in support of the Red Army, and yet one which still had something of an "independent" streak deep within.

The Soviet Air Force, as is the case with the Red Army proper, must be viewed through the prism of Communist Party involvement and intervention. This not only impacts in terms of the commissars (political officers) attached to each unit (tantamount to a second chain of command), but also as regards to the daily involvement of the Politburo in how the Red Air Force was designed, organized, equipped and was to be missioned. This effect was one that contributed to the struggle over whether the air force

should have an independent strategic role or be relegated to merely support of ground operations.

A look at some comparative numbers shows how the Soviet state was able to make some notable achievements (quantitatively if not qualitatively) in aviation in the years preceding WWII. “ In 1930 they had produced only 860 aircraft, by 1932 it was up to 2,500.”<sup>□</sup> That same year the U.S. and Great Britain combined barely equaled that number. “Between October 1936 and 1938 Russia supplied the Republican government in Spain with 1,409 aircraft. Unfortunately 83% were shot down.”<sup>□</sup> Soviet versus German and Italian air forces in the Spanish Civil war was a preview of what was to happen in the early stages of WWII.

Organizational and aircraft type changes on the eve of hostilities with Germany indicate that the Soviet Air Force three important things: one, that they had learned some lessons from the Japanese-Soviet conflict in the Far East and the fighting in the Spanish Civil war; two, that a ground support role was in fact their primary function; and three that they still had a long way to go to solidify themselves doctrinally and organizationally.

The I-15, I-16 and even the I-153 fighters were inferior to the German Messerschmitt, yet replacements were not yet available. The twin-engine SB-2 and SB-3 bombers were inferior to both the Ju88 and the He111. While they were being replaced, it was with lighter, faster machines whose primary purpose was ground support. Organization changes reflected solidification of this “close air support” role as well. Squadrons of 20-30 planes were being replaced (as the basic tactical unit) with regiments of 60-64 aircraft. In turn three to five such regiments would comprise an air division

attached directly to a ground army for mission tasking. That the Soviet Air Force was still in a state of unpreparedness on the eve of war with Germany is seen by the fact that this reorganization had, “by spring 1941, resulted in only 19 of the required 106 new air regiments being formed. Likewise, virtually none of the ground armies had received their supporting air divisions.”<sup>□</sup> To offset these technological and organizational weaknesses, the Soviet Air Force outnumbered the German Luftwaffe approximately 7,500 (with a potential 4,000-5,000 in reserve) to approximately 1,200 (split about evenly between fighter/dive bombers and high level bombers) in 1941.<sup>□</sup>

These institutional shortcomings were exacerbated by a leadership void brought on by Stalin’s purge of senior Soviet military leadership in the 1930s. Senior theorists/strategists such as Tukhachevskiy and Lapchinskiy were branded as “reactionaries” and executed. No service was hit harder than the Red Air Force. “Beginning on 23 November 1937, and continuing well into the following year, fully 75% of that services senior officers were removed from command.”<sup>□</sup> Most were executed. This included the commanding general of the Soviet Air Force (Alksnis), his deputy (Khripin), the chief of the Air Force Academy (Todorsky), seven numbered air force commanders, five military district air commanders, and senior leaders at the colonel-lieutenant colonel level too numerous to mention. This purge was limited to the military officials. Close to 500 aircraft designers and engineers were arrested (beginning in 1934) and imprisoned and/or executed as well. These losses were clearly responsible for Soviet inferiority in aircraft quality.<sup>□</sup> In analyzing whether the Soviet leadership should have developed a strategic bomber force during this interwar period we must first ask if they could have. In that an independent bomber force was temporarily created, and

given that some “large’ bombers were manufactured, it is plausible that they could have done so. However, the more germane question is whether they should have. In this regard, several factors combine against such an endeavor being appropriate. The previously mentioned technological inferiority’s, and the extreme cost associated with such a force mitigate against that course of action. Moreover, the dominate premise of large scale, ground maneuver warfare being time-tested as decisive made adoption of a strategic bombing role untenable for the Soviet Air Force at that time.

### Notes

□ Harriet F. Scott and William F. Scott, *The Soviet Art of War, Doctrine, Strategy and Tactics* (Westview Press, Boulder, CO, 1982), 39-45.

□ Alfred L. Monks, *Soviet Military Doctrine: 1960 to the Present* (Irvington Publishers, New York, 1984), 8-13.

□ Scott and Scott, *The Soviet Art of War, Doctrine, Strategy and Tactics*, 20.

□ Ibid., 63

□ Paul J. Murphy, *The Soviet Air Forces* (McFarland & Co., Jefferson, NC, 1984), 165.

□ Ibid, 164-65.

□ Ibid., 163-64.

□ Monks, *Soviet Military Doctrine: 1960 to Present*, 11-12.

□ Russell Miller, *The Soviet Air Force At War* (Time-Life, Alexandria, VA, 1983), 62.

□ Ibid., 68.

□ Ibid., 80.

□ Ibid., 80-82.

□ Ibid., 70.

□ Ibid., 70-71.

## Chapter 4

### Practical Application of Strategic Bombing Theory in WWII

Before relating what effect the Soviet-German experience on the Eastern Front had on Russia's philosophical and doctrinal views toward strategic bombing, it is helpful to provide to that experience a frame of reference. That context is what transpired in regards to the first large scale, practical trial (and error) of that theory. That is, of course, American, British and German strategic bombing in the ETO.

Nazi Germany's "blitz" of Poland in 1939, and France in 1940 demonstrated how dive bomber and fighter-bomber aircraft in close air support of modern mechanized forces could return maneuver to the battlefield. What these conquests did not feature was strategic bombing. Germany's first attempt at doing so was its effort to gain air superiority over Britain preparatory to Operation *Sea Lion*. In that epic struggle known as the Battle of Britain the Luftwaffe found itself attempting to fulfill a role it was not organized, nor equipped to perform. Not having heavy bombers, but instead mediums (Ju-87, Ju-88) designed for blitzkrieg operations. Lack of heavy strategic bombers was exacerbated by the fact that the fighter available to escort those formations was the Me-109. This was not its primary role, and due to fuel consumption rates inherent with its speed capability it could stay on station over England only about twenty minutes. Nonetheless, the Luftwaffe focused the early stages of this battle (7 Jul – 7 Aug 40) on

coastal convoys and ports (infrastructure, if you will). Had they persisted in this vein success might have been theirs as Britain had but five to six week's sustainment without imports. Beginning on 13 Aug, "Eagle Day", and continuing until about 7 Sep 40 the Luftwaffe shifted their focus to RAF airfields and the attrition of Fighter Command – tantamount to Warden's fifth ring (field-forces). Not realizing how close they were to defeating the RAF, German leadership again shifted to another center of gravity the city of London. Efforts at bombing London into submission appear Douhetian in intent (i.e. destroy the will of the people), but were more retaliatory in response to RAF Bomber Command night raids on Berlin (which were themselves in response to some random Luftwaffe attacks during the second stage of this battle). If the Battle of Britain revealed anything in terms of strategic bombing it was that not only was a properly organized and equipped bomber force necessary, but also so was a consistent focus. Moreover, long term sustainment was required. A matter of several weeks was insufficient to attain full benefits from such attacks. □

Allied strategic bombing efforts against Germany can be viewed from two different perspectives: the American daylight attacks, and the night bombing prosecuted by the RAF. As head of Bomber Command, Air Chief Marshall Sir Arthur T. "Bomber" Harris Instituted a theory of "area bombing" that was focused more on German cities at large than the industrial nodes of ball bearing plants, rail yards, etc that the Americans habitually targeted. Operating under the supposed security of darkness, and flying in single columns as opposed to mass formations Bomber Command composed half of what the Allies termed the Combined Bomber Offensive (with U.S. Strategic Air Forces providing the other half of continuous air assault on Germany). Although this combined

offensive was more in name than actuality due to divergent targeting priorities and differences amongst senior commanders, it did provide more or less continuous bombardment on the industrial web of Germany from late 1942 – 1945. Bomber Command dropped approximately 1, 047, 400 tons of bombs at a loss of over 55,000 crew in some 8,300 bombers. □ Ironically, in that strategic bombing was aimed at avoidance of the high casualties of The Great war, this represented a loss of 40% more than the number of British Empire Officers killed in that war. The U.S. Strategic Air Forces (the 8<sup>th</sup> and 15<sup>th</sup> Air Forces) under overall command of Lieutenant General Carl “Tooe” Spaatz, combined to deliver over 1,005,700 tons of bombs in over 488, 065 sorties. As an indication of that strategic focus, 28% of the tonnage was on marshalling yards, 13% on oil targets, 18% on aircraft targets and 41% on other lower priority targets. This accounted for a claim of 15,400 German aircraft “kills” (over 8,000 by the heavy bombers themselves). U.S. losses (ETO and Mediterranean Theaters combined) were in excess of 8,700 bombers and 3,500 fighters with personnel losses of 35,844 dead and another 6,000 missing. The British devoted somewhere between 40% - 50% of their total war production to their air forces, America about 35% - Germany approximately 40%. □ In assessing what these costs gained we must do so in view of the charter strategic bombing was given at the Casablanca Conference of 1942. The Anglo-American strategic bombing campaigns achieved about 75% of its mandate emanating from that conference. It can be said that they did cause the “progressive, destruction and dislocation of the German military, industrial and economic systems.” However, Germany was able to relocate and adapt much of its industry in reaction to such losses. Moreover, the portion of the role not fulfilled was the undermining of the will of the

German people. Other prewar theories and doctrines were validated however. The transportation plan in the weeks prior to Overlord gave credence to bombers in a deep interdiction role as well as strategic one. The oil campaign of June through August 1944 brought German aviation fuel production to a standstill by September<sup>□</sup> and thus proved that precision bombardment was viable. While strategic bombing did not bring Germany to her knees by itself (as advocates had maintained) it did provide an incomparable measure of indispensability to the war effort. German estimates contend that by late 1944 over two million Germans were engaged in anti-aircraft defense. Also, that about “30% of total gun production, 20% of heavy ammunition output, and 50% of electrotechnical production was devoted to the overall anti-aircraft effort.”<sup>□</sup> In summation, the jury may be still out. The post-war Strategic bombing Survey concluded that had 12,000 – 15,000 more tons be dropped on German transportation entities beginning in Feb 44 (vice Sep 44) the German war economy would have collapsed perhaps by the end of that year.<sup>□</sup>

While Anglo-American strategic bombing attacked Germany from the west, in the east the Soviet Air Force was, at first, reeling from and then punishing the German Wermacht at the operational and tactical level.<sup>□</sup> We have said before that Russia’s preference for a strategic defense was fundamental to their overall doctrine of security. Inherent in that doctrine, however, was implied the counter offensive. At the root of such an approach were certain “permanent operating factors” (also labeled “permanent factors of war”). Developed over time and codified in 1942 they were based, foremost, on the vast geographic bounds of Russia’s territory. Stalin in particular held them as sacrosanct and even after the war rigidly refused to deviate from them – even when new conditions

arose (namely the capabilities of nuclear weapons). These “factors” included: stability and morale on the home front, quantity of the army’s divisions, morale of troops at the front and rear, numerical and quantitative superiority in equipment and personnel.□

As previously indicated, the air force Russia would employ against Germany was in midst of rebuilding. Consequently, when Hitler launched *Barbarossa* on 22 June 1941 the Soviet General Staff was caught completely off guard. This was evidenced by the huge territorial gains made, and countless casualties inflicted by the Wehrmacht in the opening weeks of that campaign. While Russia traded space for time German forces drove deep into the interior of Mother Russia. From an air point of view, the success of this effort is evidenced by the fact that on 22 July (exactly one month from the beginning of that war) German bombers struck Moscow for the very first time.□ The degree of failure experienced by the Soviet Air Force in these initial weeks can be seen by some of the statistics regarding Russian losses. In the first day alone 1,811 Soviet aircraft were lost (1,489 on the ground). German losses numbered 35.□ By 25 Jun 41 Soviet aircraft losses approached 2,800. After a month of fighting German claims of Soviet aircraft downed had reached 7,500 (with 774 losses of their own). This 10 to 1 ratio is somewhat misleading as a comparative loss picture shows that while Russia had lost 70% of the air force they had begun the war with, Germany had lost 60% of the aircraft originally available to them on the Eastern Front.□ This reflects the quantitative superiority aspect of overall Soviet strategy. Moreover, their capacity to replace those losses would be much greater than that of the Third Reich.□

In addition to organizational, doctrinal and tactical shortcomings, technical inferiority of aircraft was responsible for these disparate losses. In the months and years

ahead the Soviet Air Force would redress this imbalance with several new models. However, it is indicative of their continued aversion to strategic bombing that none really filled that void. The MiG-3 fighter (1940) had an excellent top speed of 400mph and a ceiling of 40,000 feet. Unfortunately design flaws left it too unstable and poorly armed. The YAK-3 fighter (1943) was comparable to the British Spitfire and was the best Soviet fighter of the war. It premiered at the great tank battle at Kursk in 1943 and proved outstanding in an air to ground role as well. The LA-7 fighter (1944) was the most advanced Soviet fighter of the war and came with a top speed of 413 mph and two 20mm cannons (the answer to the German Focke-Wulf 190). The IL-2 Shturmovik two-seated, twin engine fighter (1942) brought to bear two 37mm cannon, one 12.7mm cannon, and two 7.62 mm machine guns in an air to air or air to ground role. The PE-2 Petlyakov twin-engine fighter-bomber was an all around aircraft capable of dropping a payload of 2,200 pounds of bombs or using four 7.62 mm machine guns in a strafing role. It came in thirty different models from ground attack to reconnaissance. The IL-4/DB-3F (1938 – 1941) twin-engine, medium bomber actually bombed Berlin in 1941. It could carry a 2,204 pound bomb payload 1,200 miles. However, its comparatively low speed (only 277 mph) soon made it obsolete. The IL-4 was succeeded by the TU-2 Tuploev twin-engine, medium bomber (1943) which had a top speed of 340 mph and a range of over 1,300 miles. It too however, was in the case of most models, modified for a ground-attack role by adding four 20mm cannons. The only true heavy bomber, the Pe-8/TB-7 (1943), was a four-engine aircraft carrying 8,800 pounds of bombs to a range of nearly 3,000 miles. In that its actual usage was primarily VIP transport for distant conferences,

we can see that strategic bombing was still not a priority for the Soviet air Force as the war progressed. □

Use of bombers in this theater, both by the Germans and the Russians, was mostly in support of ground offensives. Some typical examples can be cited. Germany's renewed offensive in 1942, in the Crimea, demonstrates massive bomber support to the assault on Sevastopol on 7 June 1942. "For five days prior, the Luftwaffe dropped 2,264 tons of high explosives and 23,800 incendiary bombs as a prelude to Von Manstein's successful 11<sup>th</sup> Army attack on that city." □ On 23-24 August of that same year the Luftwaffe's VIII Air Corps sent 600 bombers (in some 2,000 sorties) to strike Stalingrad as a prelude to that epic struggle. Focused on breaking the will of the citizenry to resist, over half the bombs dropped were incendiary. By the next morning there were over 40,000 dead amongst the inhabitants. □ The Stalingrad campaign also gives us illustrations of how the Red Air Force was employed in this operational support role as well. By the fall of 1942, and after continuing to suffer horrific losses due to Luftwaffe air superiority during daylight hours, the Soviet Air Force adopted a tactic that would prove successful. Emerging from concealed positions amidst relatively primitive airfields, Il-4 twin engine bombers of a newly formed "long range" bomber force would strike German rear areas. Concurrently, IL-2s and the old PO-2 biplane would hit German airfields. This process was repeated as often as five times each night. As a consequence, Luftwaffe fighter superiority was offset, and after five-six weeks of repetition not only were German aircraft being attrited, but disruption of German maneuver force staging and sustainment was affected. □ In mid-October 1942 the Red Army launched its largest, and ultimately successful, attack to retake Stalingrad from Field Marshal Von Paulus and the German 6<sup>th</sup>

Army. Up to that point German losses were about 42,000 casualties. Russian losses were unknown but surely in excess of that. On 19 Nov more than one million Russian troops supported by 13,500 artillery pieces and assault guns, 980 tanks, and nearly 1,500 aircraft struck.<sup>□</sup> Despite weather that limited German air sorties to only 150 in four days, Russian aircraft flew approximately 1,000. The week following that, another 6,000 (from three Soviet Air Armies). The Il-2 Shturmovik, Yak-9 and La-5 fighter were the backbone of that effort. About two thirds of those missions were against German airfields. This attrition warfare against the Luftwaffe caused the German High Command to decide on leaving the 6<sup>th</sup> Army in place and attempt resupply via air. That decision only increased the opportunity for the Red Air Force to continue daily attrition of relatively meager German air assets. When Stalingrad fell to the Red Army in early February 91,000 German troops were captured. The Luftwaffe had lost close to 500 aircraft in that struggle.<sup>□</sup> Moreover, this campaign reaffirmed to the Red Army the use of the Red Air Force in a close air support and or operational support role. In fact, an operational level role was the only real “independent “ function given the Red Air Force during the war. It was one akin to what the Allied Air Forces did in France prior to the Normandy invasion with their destruction of the communication and transportation structure behind the German front. In May 1943 Stalin issued an order proclaiming that “Strikes against railroad trains and attacks against motor columns are the most important missions of our VVS.”<sup>□</sup> The air armies of seven fronts and Long Range Aviation were committed to that endeavor. Soviet success in the fighting at Kursk was enhanced by the air campaign which resulted in the German postponement of their offensive from June to late July 1943.

The climactic Battle of Berlin gives perhaps the best example of the Red Air Force in this ground maneuver support role. By that time (April 1945) Berlin would be bombed not as a strategic target far to the rear of any front line, but as the primary operational, then tactical, objective of the Red Army's final drive of the war. In support of that assault 7,500 combat aircraft were utilized. Both medium bombers and fighter-bombers were combined in successive waves to pummel German defenses into submission. The magnitude of this effort can be seen in the fact that as a prelude to the final ground assault the Red Air Force flew in at extremely low altitude and dropped a smoke screen across a 390 km front. □ An analysis of actual Soviet air operations during WWII, and whether a strategic bombing force was viable during that period must address certain key questions. First, could a Soviet strategic bombing assault on Germany been an effective compliment to the Anglo-American strategic bombing effort described above? Was such a Soviet effort possible? Unlike the economically austere period between the wars, the Soviets could have built and employed a strategic bombing force during, say, 1942-1945. Given the vast influx of money and materiel and technology pumped into the USSR by America during the war, and the increased industrial production of that country internally, such a force could have been created. However, it should be remembered that the Eastern Front and the Western front were essentially two separate theaters where closely coordinated efforts were never really attempted (not withstanding Stalin opening a renewed large scale offensive within a few weeks of d-day in 1944). Inherent in that separateness was a lingering distrust between the Soviets and the Anglo-Americans as to ultimate post-war intentions. This served to have each pursue their own ways and means of defeating Germany. Accordingly, it is unlikely that Russia would have created a strategic

bombing force at the expense of their massive operational and tactical air force which was so crucial to the success of their large ground campaigns.

### Notes

□ Center for Air Force History; Benjamin Cooling, Ed., *Case Studies in the Achievement of Air Superiority* (Washington, D.C., 1991), 116-122.

□ Richard G. Davis, *Carl A. Spaatz and the Air War in Europe* (Center for Air Force History, Washington, D.C., 1992), 587-588.

□ Ibid., 587.

□ Ibid., 589.

□ Ibid., 590.

□ Ibid., 588.

□ Richard Muller, Interview, 19 Feb 99.

□ Monks, *Soviet Military Doctrine: 1960 to the Present*, 15.

□ S.M. Shtemenko, *The Soviet General Staff At War: 1941-1945* (Progress Publishers, Moscow, 1981), 36-41.

□ Russell Miller, *The Soviet Air Force At War*, 84-85.

□ Ibid., 87.

□ Russell Miller, *The Soviet Air Force At War*, 84-87.

□ Ibid., 128-132.

□ Ibid., 111.

□ Ibid., 116-117.

□ Ibid., 118.

□ Ibid., 122.

□ Ibid., 123-127.

□ M.N. Kozhevnikov, *The Command and Staff of the Soviet Army Air Force in the Great Patriotic War 1941-1945* (Moscow, USSR, 1977), 121-122.

□ Russell Miller, *The Soviet Air Force at War*, 156-160.

## Chapter 5

### The Strategic Paradigm Begins to Shift

Many lessons learned were taken from WWII by the Soviet Air Force. Most were of their own experience against Germany, but some were of what they observed in other theaters. This included the strategic bombing in the ETO and also America's use of the atomic bomb in the Pacific. In actually practicing the use of close ground support by air of combined arms teams of armor and motorized infantry, the main problem was how to do so with rapid response, flexibility and yet avoid friendly casualties. Such avoidance was a concern not so much as to the loss of life but so as to preclude the potential combat ineffectiveness within the units suffering such loss. That the Soviet Army and Air Force were able to solve that problem to their satisfaction affirmed to them that their premise of operational offensives within an overall strategic defense was valid. They did so by centralizing control of aviation at the ground army commander level.<sup>□</sup> This allowed shifting of attached air divisions and air regiments to different locations brought about by changing situations. In terms of operational interdiction and bombing in the enemy's rear STAVKA liaison officers at the army and army front level were employed to be able to shift, at the Front Commander's behest, air assets between the Frontal Aviation units (tactical) and the Long Range Aviation (operational).<sup>□</sup> The swift and rapid movement of the Red army was greatly facilitated by such arrangements.

At first glance Soviet immediate post-war strategic vision was apparently little changed from that of the pre-war period. In fact evidence exists to suggest that. Increases in the means to conduct armored war were not only maintained but also increased, fighter aircraft and close air support aircraft (such as the *Shturmovik*) production over that of bomber production remained the priority. But to use one of Churchill's favorite phrases, that was "more apparent than real." Indeed, Stalin's adherence to those "permanent factors" (especially the notion that Russia's vast territory would always preclude a successful enemy invasion) while resulting in efforts to continue a readiness based on the last war, was also beginning to accept that new conditions had arisen. Despite the fact that the Soviet TBA (Heavy Bomber Force), later redesignated DBA (Long Range Bomber), had achieved virtually nothing at the strategic level during the war, a crash program was started to create a truly modern heavy bomber – the Tu-4 (patterned after the American B-29). This was recognition of what capability Russia's most fearsome potential enemy had available. Not unlike the 1920's and 30's, the Soviet military in the late 40's and early 50's found itself in a position of technological inferiority as compared the West. As a result the Tu-4 remained vulnerable to air defenses and was nowhere near as capable as the Boeing B-47. □

However, political struggles both internally with his military and externally with the Cold war were forcing Stalin to grudgingly adapt a new manner with which to defend the Soviet Union. Stalin reverted to his pre-WWII premise the Western nations were his enemies. So he must stay prepared to defeat them on the battlefield. However, although his strategic defense against Germany had proven highly successful it had been accomplished without a strategic bombing force (which now seemed useful, even

necessary, against an adversary whose atomic capability had all ready been proven). The problem for him was political. He could not easily claim sole responsibility for victory in the Great Patriotic War (which he did) without also bearing responsibility for a strategy that might well be bankrupt in the post-war era. Therefore, he looked for development of some form of intercontinental attack. In 1949, V.M. Myasishchev was detached from the Soviet Air Force to establish a special bureau tasked with developing an intercontinental jet bomber. Tupolev was assigned a parallel project. While Myasishchev's all jet work resulted in the Mya-4 (BISON), Tupolev believed a turboprop design to be superior to that of an all jet and accordingly expanded on the Tu-4 with ever increasing versions of it. This culminated in the Tu-95 (BEAR). Both designs were remained similar to the B-29 with multiple defensive guns, and a centralized fire control system. Whereas post-war Western bombers were being built with speed as their primary defense and did not use optical bomb aiming, these Soviet designs were more conventional (that is to say outdated) in both regards. As an example, the BISON had four engines compared to the B-52s eight. In 1951 the twin-jet engine Tu-16 (BADGER) replaced the Tu-4. □

The death of Stalin in 1953 made it possible for those responsible for Soviet national security to take advantage of the revolution in military affairs that the nuclear age had brought about. A review of Soviet bomber development in the decade of the 50's and into the early 60's shows that they had embraced the concept of strategic bombing, and had designed a force to execute such a strategy. Often called "missile carriers" the Soviet medium and heavy bomber program of the mid- and late 50's culminated with the production of the M-50/52 BOUNDER (a four-engine supersonic strategic bomber). □

However, Soviet leadership also struggled with determining the best means to deliver nuclear weapons, and in what proportion should those delivery means be.

#### Notes

- M.N. Kozhevnikov, *The Command and Staff of the Soviet Army Air Force in the Great Patriotic War 1941-1945*, 163.
- Ibid., 162.
- Paul J. Murphy, *The Soviet Air Forces*, 164-167.
- Ibid., 168-170.
- Ibid., 171.

## Chapter 6

### The Cold War and Intercontinental Bombing

The late 50's largely rejected Stalin's "permanent factors". In 1960 Khrushchev was announcing that the "revolution" in warfare required that future wars would begin with deep nuclear strikes. In a January 1960 speech to the Politburo he announced this, and also that large numbers of men could be demobilized in favor of long range, strategic missiles (organized under the Strategic Rocket Forces –SRF). That bombers too were be cut back in favor of ICBMs is seen in that: In 1961 Bison production ended, BADGER (and its successor the Tu-22/BLINDER) production was cut in half, and the costly, how powered, long range BOUNDER (though manufactured) never went into service in large numbers. Instead the massive SS-6 ICBM took its place. This change in focus toward strategic bombing across continents was forced upon the Soviet Union because of nuclear weapons. However, the choice of ICBMs in lieu of bombers was made in an attempt to save money in an era where Russia's unprecedented military expenditures were deemed by many in the Party (foremost Khrushchev) as excessive to the detriment of consumer needs domestically. However, strategic bombers offered flexibility in not only having the utility to be recalled after launching (where missiles couldn't be), but also in affording a theater strike capability within Europe. Missiles provided an intercontinental effectiveness superior to that of bomber aircraft.

Reductions in conventional forces fundamental with their capability replaced, theoretically, by nuclear warheads was a part of such policy as well (not unlike what the Eisenhower Administration was undertaking in the U.S.). Khrushchev's suspension of the normal Five-Year Plans, in favor of a Seven-Year Plan, in 1959 was an attempt to provide longer-term benefit from this new focus and thus provide some relief to the populace. □

Doctrinal challenges facing the Soviet military in general, and the Red Air Force in particular, were larger than merely whether to use aircraft or missiles to bomb a Cold War adversary. Scientific and technological advances during this period made the outmoding of costly systems occur faster than in previous generations. The relationships between ground and air forces, and the air functions and roles within that relationship had to be re-looked in light of the nuclear revolution in military affairs. In that regard, tactical nuclear weapons and much improved conventional multiple-launch rocket systems became part of the arsenal of the Red Army to be used within the European Theater. The air force was caught between its recent shift to a strategic bombing and a more traditional role of primarily ground support. The emphasis in the late 60's and 70's on fighter and fighter-bomber production is evidence of their return to that more historic function of ground support. □

While intercontinental bombing would be the province of the SRF with ICBMs, the requirement for regional theater bombing necessitated the production of and Red Air Force ability to employ those bombers originally intended for intercontinental use in a regional bombing role. Subsequent models, such as the, Tu-22M/BACKFIRE, were

designed with that “in-theater” role in mind. Two considerations came into play in that regard. First, although slow in relation to the speed of missiles, these bombers afforded the Soviets the capacity to hit Europe-based enemies with nuclear weapons with comparative celerity (as opposed to the ten plus hours to strike mainland America in the same way). Second, by the mid-60’s Khrushchev doctrinal premise that future wars would always be started by nuclear strikes abroad had been rejected. Instead the Soviet military had come to see that a world or regional war might be initiated with conventional weaponry. Accordingly, and to prevent immediately resorting to the nuclear trump card a need existed to have the capability to strike NATO targets with conventional warheads – a capability their SRF missiles did not have. Additionally, some of that bomber force could be withheld to carry nuclear bombs if developments warranted such use. □

It is interesting to note that while the Soviet military had come to accept, with its own variances, the concept of strategic bombing, by the 1970’s and 80’s they had again shifted towards the more traditional view of a combined arms ground campaign being decisive in future wars. However, they did so not by returning that historical idea of a strategic defensive, but by envisioning a strategy by which they would strike offensively in Europe (conventionally and/or with nuclear weapons). In addition to a change in strategy, a shift in underlying war theory had taken place. In lieu of those “permanent factors”, more evolving concepts were surfaced. In 1972 this was manifested in V. Savkin’s published “four laws” of war:

- course and outcome of war waged with unlimited employment of all conflict depend
- primarily upon the correlation of available strictly military forces of the combatants at the beginning of the war, especially in *nuclear weapons and means of delivery* (italics mine).

- course and outcome of war depend on the correlation of the military potentials of the
- combatants.
- Course and outcome of war depend on its political content.
- Course and outcome of war depend on the correlation of moral-political and
- psychological capabilities of the people and armies of the combatants. □

However, these were only “suggested” laws and not definitive. By 1977 the Soviet

Military Encyclopedia had officially stated six laws of war:

- The dependence of war on its political goals. War is a social function whose essence
- is determined by the political and social character of its people and their classes.
- The dependence of the course and outcome of war on the correlation of economic
- strengths of the warring states. Relative industrial capacity translates to relative military strength.
- The dependence of the course of war on the correlation of scientific potentials of the
- warring sides. Technological-scientific development in a nation has significant impact on military power of that state.
- The dependence of the course and outcome of the war on the correlation of moral-
- political strengths of the warring states. The ideologies and degree of psychological preparation of the armed forces and the populace have a major impact on relative military power.
- Dependence of the course and outcome of the war on the correlation of military
- forces. Victory and defeat in war are defined by relative military power and mobilization potential of the warring sides.
- Historically, the side wins that offers and uses the resulting capabilities of a new and more progressive social and economic order. □

These articulated beliefs were the result of two decades of repudiation of Stalin-era strategic doctrine. The air force and SRF strategic roles discussed in this chapter, and during that period of change, clearly give proof of that shift.

## Notes

- Paul J. Murphy, *The Soviet Air Forces*, 172-174.
- A.A. Grechko, *The Armed Forces of the Soviet State* (Moscow, USSR, 1975), 146-150.
- Paul J. Murphy, *The Soviet Air Forces*, 185-187.
- William Baxter, *Soviet Airland Battle Tactics* (Presidio Press, Novato, CA, 1986), 8.
- *Ibid.*, 9.

## Chapter 7

### Analysis and Conclusions

Why did the Soviet Union not embrace the Douhetian theory of strategic bombing even as other world powers did? Throughout the 1920's and 30's leading nations around the world not only strove to create a viable air force for utilization in future wars, but did so with an emphasis on strategic bombing. This Revolution in Military Affairs (RMA) was viewed by its advocates as something that could potentially preclude massive, protracted land campaigns and the atrocious casualties inherent therein.

Extensive practical application of such a bombing theory in WWII, including the Anglo-American effort against Germany and that nation's response, failed to alter the Soviet focus on certain "permanent factors" which precluded long range, strategic bombing of her adversaries. As Russia conducted a strategic defense against Germany on the Eastern Front, its Air Force found itself, initially destroyed in great numbers by a numerically inferior force – the Luftwaffe. This was due to several factors: technically poorer aircraft, outdated tactics, and (perhaps most significant of all), the fact that they were in the very midst of a structural and leadership reorganization and ill-prepared for the commencement of hostilities. Some token efforts at bombing Berlin aside, the fighting that raged on that front for four years between those two protagonists, confirmed to the Soviet senior leadership the correctness of using their air force in a ground support role.

That they were able to overcome those atrocious early setbacks and ultimately to gain air superiority over their German adversary was due to their ability to adopt to those shortcomings by changing tactics and organization, and by creating a bevy of new aircraft designed for that support role. Vastly superior numbers contributed greatly as well. During this watershed period, the Soviet Air Force created the *Long Range Aviation* branch of the air force. Far from a strategic bombing arm, it was an operational level strike force. Its creation shows that they had expanded the ground support role of the air force beyond merely close air support to include deep battle interdiction as well. As stated in the second main point of this paper, only with the RMA of nuclear weapons (and the death of Stalin) was strategic bombing to become central to national security doctrine. The Cold War reinforced this shift, but also, ironically, resulted in (as the third main point of this work puts forth) the Soviet Air Force returning to its more traditional primary role of ground support. Manifesting this was the Soviet Union's creation of the Strategic Rocket Force (SRF) which assumed the major responsibility for transporting ICBMs towards America. Nonetheless, the strategic bombing force they had relied on was maintained as a theater -level force capable of delivering both nuclear and conventional bomb loads on NATO countries. This aircraft-based bombing force also afforded a strategic flexibility the SRF did not. Ironically, at this point in Soviet history strategic bombing meant striking at a Cold War enemy much farther away than ever contemplated in WWII. Meanwhile the aircraft bomber force was relegated to being prepared to strike at nations, within Europe itself, that would most certainly have been considered strategic in nature during the years when this theory was promulgated and practiced on its largest scale. In analyzing whether or not the Soviet military could, or

should, have embraced strategic bombing theory sooner, we must ask if it was feasible, and if so, was it the best course of action available. Clearly, during the early development of the Soviet Air Force it was not really practical (despite the fact that such advocates existed, for a time). During WWII, however, such a force was possible. It might have even been effective. Yet, given the fact Russia was facing Germany totally alone on the Eastern Front, their decision to create tactical (“frontal”) and operational (“long range”) aviation rather than strategic was a wise decision. The success that resulted in that theater bears testimony to that wisdom. Likewise with the advent of nuclear weapons. The Soviet leadership demonstrated admirable adaptability in creating a strategic bombing force to offset that of the U.S. Likewise, in the later stages of the Cold war, such flexibility was again manifested with the utilization of a mixed force of rockets and bombers that could (between the two) deliver both conventional and nuclear warheads intra- and intercontinentally.

## ***Bibliography***

- Baxter, William. *Soviet AirLand Battle Tactics*. Novato, CA: Presidio Press, 1986.
- Black, Steven K. *The Icarus Illusion: Technology, Doctrine and the Soviet Air Force*. Monterey, CA, 1986.
- Cockburn, Andrew. *The Threat: Inside the Soviet Military Machine*. New York: Random House, 1983.
- Collins, John M. *American and Soviet Military Trends*. Georgetown University: The Center for Strategic and International Studies, 1978.
- Cooling, Benjamin, Editor. *Case Studies in the Achievement of Air Superiority*. Washington, D.C.: Center for Air Force History, 1994.
- Davis, Richard G. *Carl A. Spaatz and the Air War in Europe*. Washington, D.C.: Center for Air Force History, 1993.
- Dick, C.J. *Soviet Doctrine, Equipment, Design and Organization: An Integrated Approach*. *International Defense Review*, No. 16, 1983.
- Grechko, A.A. *The Armed Forces of the Soviet State*. Moscow, 1975.
- Griffin, H. Dwight, Richard McFarland, Debra Molloy, Richard Muller, Robert Pecoraro, and Jan Rosko. *Air Corps Tactical School: The Untold Story*. Maxwell AFB, AL: Air University Press, 1995.
- Hansen, James H. *Correlation of Forces: Four Decades of Soviet Military Development*. New York: Praeger, 1987.
- Kozhevnikov, M.N. *The Command and Staff of the Soviet Army Air Force in the Great Patriotic War 1941 –1945*. Moscow, 1977.
- Mellinger, Philip S. *The Paths of Heaven: The Evolution of Air Power Theory*. Maxwell AFB, AL: Air University Press, 1997.
- Miller, Russell. *The Soviet Air Force At War*. Alexandria, VA: Time-Life, 1983.

- Monks, Alfred L. *Soviet Military Doctrine: 1960 – Present*. New York: Irvington Publishers, 1984.
- Muller, Dr. Richard. Interview. Air Command & Staff College. Maxwell, AFB, AL: Air University, 19 February 1999.
- Murphy, Paul J. *The Soviet Air Forces*. Jefferson, NC: McFarland & Co., 1984.
- Schwabedissen, Generalleutnant J.A. *The Russian Air Force In the Eyes of the German Commanders*, USAF Historical Studies Series No. 175. Washington, D.C.: Center for Air Force History, 1960.
- Scott, Harriet F. and William F. Scott. *The Soviet Art of War, Doctrine, Strategy and Tactics*. Boulder, CO: Westview Press, 1982.
- Shtemenko, S.M. *The Soviet General Staff At War: 1941-1945*. Moscow: progress Publishers, 1981.
- Swider, Raymond J. *Background and Development of Soviet Military Doctrine*. Maxwell AFB, AL, 1986.
- Uebe, Generalleutnant D. Klaus. *Russian reactions to German Air Power in WWII*, USAF Historical Studies Series No. 176. Washington, D.C.: Center for USAF History, 1964.

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