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TRANSLATION

HERALD

OF THE

AIR FLEET

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EXPLANATORY NOTE

This publication is a translation of Herald of the Air Fleet, (Vestnik Vozdushnogo Flota) a monthly journal of the Soviet Air Force published by the Military Publishing House, Ministry of Defense, USSR.

Every effort has been made to provide as accurate a translation as practicable. Soviet propaganda has not been deleted, as it is felt that such deletion could reduce the value of the translation to some portion of the intelligence community. Political and technical phraseology of the original text has been adhered to in order to avoid possible distortion of information.

Users and evaluators of this translation who note technical inaccuracies or have comments or suggestions are urged to submit them to: Commander, Air Technical Intelligence Center, Attention: AFCIN-4B, Wright-Patterson Air Force Base, Ohio.

AIR TECHNICAL INTELLIGENCE TRANSLATION

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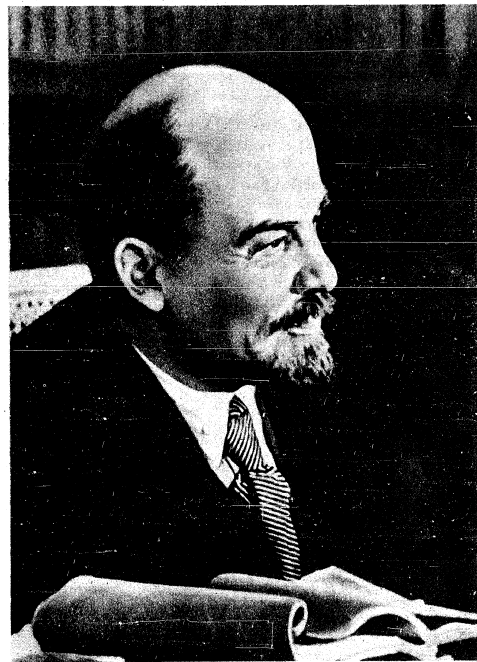
AIR TECHNICAL INTELLIGENCE CENTER
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[The two pictures on page 114 and 115 constituted a color insert in the original. They are reproductions of pictures by Prof. G. I. Pokrovskiy showing a spaceship with aerodynamic design which will ensure return to earth of the carrier-rocket stages and the spaceship itself. The picture on page 114 shows the blast-off and the action of the booster rockets. The picture on page 115 shows the second-stage boosters working.]



Vladimir Il'ich
LENIN

GUARDING THE ACHIEVEMENTS OF GREAT OCTOBER

Forty years ago, by the will of the Communist Party — led by the great Lenin, the Armed Forces of the first Soviet country in the world were established. On 23 February the Soviet people will observe Soviet Army and Navy Day, which has become one of the most popular and beloved holidays.

The founding of the Soviet Army, Air Force and Navy was one of the conditions making for victory of the Soviet people over external and internal counterrevolution. V. I. Lenin taught that a revolution is worth something only if it is able to defend itself. The Great October Socialist Revolution proved, in fact, that it could defend itself and protect its achievements. The Armed Forces carry out their task of defending the October achievements with dignity and honor.

The Soviet Armed Forces were fostered by the Communist Party and by the great leader of the working people, V. I. Lenin — the wise strategist of the Socialist Revolution, the founder of the Communist Party and of the Soviet State. Preparing the working class for the overthrow of autocracy, for the liquidation of the power of the landowners and the capitalists, V. I. Lenin foresaw that the exploiting classes would not voluntarily leave the historical arena. They would resist desperately in order to prolong their supremacy. Therefore even during the period of preparation for and development of the first Russian Revolution, V. I. Lenin called the working class to arms and to the creation of fighting detachments. V. I. Lenin taught the working detachments the tactics and methods of street and barricade fighting; he organized their supply of arms; and he looked after the leader cadres.

The Red battle standard, stained with the blood of the combatants of 1905, was taken up like a relay baton and raised still higher by the fighters of the Red Guard detachments of 1917, hardened in the fire of October's battles.

The passing of power to the hands of the Soviets did not mean that henceforth the Revolution would develop peacefully. On literally the day after the overthrow of the Provisional Government an armed counterrevolution against the Soviet Government broke out. Kerenskiy, fleeing from Petrograd in a motor vehicle of the American Embassy, moved the Cossack units with Gen. Krasnov in command towards Petrograd.

Detachments of Red Guards and revolutionary seamen advanced to the front. With a violent attack the troops of the Revolution crushed the White Guard regiments, occupied Tsarskoye Selo and Gatchina, arrested the staff of the cavalry corps headed by Krasnov and disarmed the Cossacks.

In the following weeks and months counterrevolutionary centers on the Don, in the Kuban' and in the Southern Urals were destroyed. The conspiracies of the

White Guardsmen could not stop the triumphal march of Soviet power. The armed workers showed that they were a great force, capable of defending the achievements of the Revolution.

International imperialism came to the aid of the overthrown exploiting classes of Russia. The millionaires and billionaires of all the countries in the world could not reconcile themselves to the victory of the proletarian revolution, a challenge to the entire capitalistic system.

The country was threatened by mortal danger. In order to overcome this danger it was necessary to create our own Soviet army, built on essentially new principles, an army whose weapons for the first time in history were used, not against the people, but for the defense of revolutionary achievements and of the freedom of the workers; not for the seizure of foreign territory, but for the defense of our native land against imperialist invaders.

"The Declaration of the Rights of the Workingman and of the Exploited People" written by Lenin and published on 17 (4) January 1918 proclaimed: "In the interest of guaranteeing the absolute power of the working masses and the elimination of any possibility of the restoration of the exploiters' power, the arming of the workers, the formation of a Socialist Red Army of workers and peasants, and the complete disarmament of the propertied classes are decreed."

On 28 (15) January 1918 V. I. Lenin signed the decree of the Council of People's Commissars on the organization of the Workers' and Peasants' Red Army, and on 14 (1) February the Soviet Government issued a decree on the organization of the Workers' and Peasants' Red Navy. These historical documents formulating the Leninist principles for the building of the armed forces of a dictatorship of the proletariat were the foundation of the Soviet Army and Navy.

The creation of a regular Red Army was very timely, since the Soviet Republic soon found itself in a fiery ring of fronts. For more than three years the young armed forces repulsed the onslaught of predatory imperialists and the internal counter-revolution. The Soviet people experienced and overcame severe privations and unheard of difficulties. Gathering together all its strength, the Soviet people supplied the Army with weapons, ammunition, and foodstuffs.

International detachments and units, composed of revolutionarily disposed Chinese, Hungarian, Polish, Yugoslav, Finnish, Rumanian, German and Czechoslovak comrades, fought shoulder to shoulder with Russians, Ukrainians, Byelorussians, Latvians and representatives of the other peoples of our country against the enemies of the Revolution.

The source of the strength and power of the Red Army, the inspiration for its victories, was the Communist Party. Under its leadership a genuine People's Army was created — an army representing the friendship and brotherhood of the peoples of our country, imbued with a sense of international duty.

Displaying unprecedented heroism, high ideals, and devotion to the cause of socialism, the Soviet people and its young Army routed the hordes of White Guardsmen and interventionists, all armed to the teeth.

During the period of peaceful socialist building, the imperialists attempted more than once to test the strength of our borders and always met with a decisive rebuff. However, they continued to nurse their bloody plans for the destruction of the Soviet

Union and in 1941 hurled against our Motherland the striking force of imperialism — the army of Hitlerite Germany. The Great Patriotic War of the Soviet people began. This was a severe test of the durability of the Soviet system and of the viability of our socialist state.

The Soviet Armed Forces and the entire Soviet people, girding themselves for the sacred Patriotic War, broke the back of the Fascist beast, smashed the Hitlerite armies, and thereby showed again the fate awaiting those who base their adventurist calculations on the fragility of the socialist system.

The heroic deeds of the Soviet soldiers and the remarkable victories at Moscow and Stalingrad, at Kursk and Belgorod, on the Dnepr and the Neman, at Budapest and Vienna, and in the final battle of Berlin, will never fade in the memory of nations!

Soviet pilots displayed great skill, courage and heroism during the years of the Great Patriotic War. Fighting for their beloved Motherland, in the name of her freedom and independence, day and night they dealt crushing blows to the enemy, destroying his manpower and equipment.

With each day the skill of our pilots grew; ways and means for the operational and tactical utilization of aviation were perfected; the control of air detachments from the ground and in the air was improved.

In battles with the enemy our pilots displayed unparalleled valor, heroism and courage, and commanders and chiefs exhibited ability and great skill in directing air operations.

Trained by the Communist Party, our pilots and navigators, engineers and technicians, and men from the various branches of the Air Force specialties honorably fulfilled their duty to the Motherland. The Soviet people will never forget the courage and heroism displayed by them in the Great Patriotic War.

The Soviet people and its Armed Forces bore the main burden of WWII. The people and soldiers of Poland, Yugoslavia, Czechoslovakia, Albania and, subsequently, also the armed forces of Rumania, Bulgaria, and other European countries, courageously fought side by side with the Soviet people and its heroic Army against Fascism. The great Chinese people and its valiant People's Liberation Army played a large role in the utter defeat of Japanese imperialism.

The organizer and inspirer of the universally significant and historic victories of the Soviet Union was the glorious Communist Party. In its severe trials the Party drew still closer to the people and to the masses of soldiers. The Soviet soldier considered it a great honor to go into combat as a member of the Communist Party.

The constant and immediate direction by the Central Committee of the CPSU and by the Soviet Government of all policy in the field of military development always has been, is, and will be the deciding factor in the might of the Armed Forces of the USSR.

The Party organizations and political organs of the Soviet Army, armed by the resolution of the October Plenum of the Central Committee of the CPSU, are strengthening their influence on the entire process of forming Soviet soldiers, on the raising of the morale and political condition of the troops and of their combat preparedness. Ideological and political life in the Armed Forces has been revitalized. All personnel have rallied still more closely about the Communist Party, its Central Committee and the Soviet Government.

The Soviet Union, the Chinese People's Republic, and all the countries in the so-

cialist camp invariably and consistently fight for the easing of international tension. However, the bosses of the imperialist camp are stubbornly pursuing a policy of aggravating relations among states, of further intensification of the arms race and extension of aggressive blocs.

As long as imperialism exists it is impossible to relax our vigilance against the intrigues of foreign enemies; it is necessary to increase the might of the Soviet Union and its defensive capability, which is in the interest not only of the peoples of the USSR and of the socialist camp, but of all humanity. The powerful Armed Forces of the Soviet Union, always prepared for combat, are one of the means for curbing the imperialist aggressors and are the best guarantee for the preservation of world peace.

The basis for the steady increase in the strength of the Soviet Armed Forces has been the general rise in the national economy of our country, and the success in the development of heavy industry, science, and technology in the post-war period. The fortieth year of the existence of our state has been marked by especially remarkable achievements of Soviet science and technology. Soviet scientists, designers, engineers and workers performed the greatest feat in carrying out the launching of artificial earth satellites, thereby showing the entire world of what the creative genius and constructive labor of the people of a socialist society, free of the fetters of capitalist oppression, is capable.

The Soviet Armed Forces, created and trained by the Communist Party, are at the present time stronger than they have ever been. They are capable of crushing any aggressor if he makes encroachments on our Motherland. They now are not only completely mechanized, but have the most up-to-date arms. We have atomic and nuclear arms and rockets of various ranges — including intercontinental rockets.

"... We have launched a satellite on the principle of an intercontinental ballistic rocket," said N. S. Khrushchev. "... If required, we can launch more artificial satellites; we shall launch as many as are necessary, because for this we require nothing new in technology."

Our Air Force has risen to a higher stage in its development. It now has at its disposal superior jet aircraft and the latest instruments which permit the solution of any problem, at any time of year, day and night, and at any distance.

As recently as 1957 our country's aircraft pool was reinforced by such remarkable aircraft as the Tu-110, An-10, Il-18 and Tu-114. The latter is the largest passenger aircraft in the world, capable of covering vast distances without landing. During the past year our aviation acquired the new Mi-6 helicopter with two turbo-prop engines.

Combat aircraft created by Soviet designers, engineers, and workers broke the so-called sound barrier long ago. They possess high maneuverability, powerful armament, and first-class equipment.

The men of the Air Force are welcoming the Fortieth Anniversary of the Armed Forces with new successes. Their combat skill has increased. This is encouraged by socialist competition which embraces the men of the various specialties. Widespread preparation for elections to the Supreme Soviet of the USSR revitalized agitational, propagandistic, Party and political work; enlisted aviators in the struggle for a further increase in training, combat and political preparedness, and for the strengthening of military discipline and combat readiness of the units and outfits.

In the Air Force the number of rated pilots and navigators, and of outstanding specialists, outstanding crews, flights and squadrons, has increased considerably.

Great success in combat and political preparation was achieved during the past training year by personnel of the units and outfits commanded by N. F. Klimenko, P. A. Darmoyan, I. N. Il'in, A. P. Sitnikov and A. N. Prokhorov.

Among the most advanced was the bomber squadron commanded by Military Pilot First Class Communist Maj. Ye. D. Bogdanov. The crews of this squadron successfully carried out many bombing missions from high altitudes, on the run, on unfamiliar bombing ranges, day and night under adverse weather conditions. One of the best squadrons in a fighter unit was the one commanded by Military Pilot First Class Maj. V. I. Fomin, master of aerial gunnery.

The squadron commanded by Communist Maj. N. S. Gorskiy obtained good results in its combat and political training. Here all Communists became outstanding men. Maj. Gorskiy, as one of the best air squadron commanders of the group, for the conscientious fulfillment of his military duty and for outstanding combat and political preparation, was awarded an Honorary diploma by a decree of the Presidium of the Supreme Soviet of the Karelian ASSR.

The squadron commanded by Military Pilot First Class, Communist F. F. Shibayev has been operating for twelve years without flight accidents. This has been achieved because of the untiring struggle for the exact fulfillment by the personnel of the requirements of regulations, directions and instructions regulating flight operations, and because of the uncompromising attitude of the commander and the Party organization toward shortcomings.

Engineers, technicians, and junior Air Force specialists set an example in carrying out assigned missions. Among the outstanding men of the Air Force Engineer Service are Air Force Engineer Service Deputy Commanders Yu. G. Mizyuk and V. N. Pisarev, Regulation Inspection Service Group Chiefs, officers I. I. Pavlov and A. F. Sviridov, TECH [Technical Maintenance Unit] Chief, Engineer Maj. S. A. Nikolayev, Radio and Radar Equipment Engineer, officer V. Ya. Fischelev, Flight Technician V. K. Kornev and others.

The resolution of the October Plenum of the Central Committee of the CPSU has given rise to a new surge in the activity of the entire VVS [Air Force] personnel. Political organs and Party organizations are going more deeply into all aspects of combat preparation, military discipline and training of personnel. On the basis of a business-like criticism of principles, Communists boldly reveal defects in instruction and training of soldiers and simultaneously help commanders to take timely measures for the elimination of shortcomings which hinder an increase in the combat preparedness of the units and outfits.

In the new training year aviators are confronted by the problems of further combat improvement and the acquisition of fixed habits in using the latest equipment with which the Air Force is outfitted. Pilots of the bomber, fighter and other Air Force branches must perfect their habits in carrying out training and combat missions without simplifications, against a tactical background, and in anticipation of heavy enemy countermeasures.

It is necessary to devote the greatest attention to the study of equipment and the mastery of it. Only the pilot who is capable of carrying out combat missions in any kind of weather, day and night, can be considered thoroughly trained to defend the

Motherland. This is achieved by intensive training on the ground and in the air. If a pilot has sufficient and regular practice in instrument flying and systematic training in instrument landings, then he is not afraid of any weather.

To be able to fly well and to have perfect mastery of the technique of piloting is still not all. It is necessary to learn to carry out combat missions successfully: to break through any enemy screening force, to drop bombs with accuracy on assigned targets and to gain victories in aerial combat. It is necessary for a pilot to have a perfect knowledge of tactics. For this purpose every flight should be saturated with tactical elements; new tactical methods should be considered beforehand and skillfully used; and the experiences of topnotch air fighters should be studied.

Our bombers must fly for great distances, operate on unfamiliar bombing ranges, and carry out the greater part of their practice bombings on tactical targets. It is not possible to consider a bomber crew thoroughly trained if it cannot bomb at night or through clouds, since combat operations in modern warfare can develop at any time of the year or day. Every navigator must have a perfect mastery of navigation, using for this purpose various up-to-date facilities; he must be able to approach an assigned target with accuracy at the prescribed time and to hit it precisely.

Our fighters and bombers must work hard and persistently to perfect their combat skill. By virtue of their function they are duty-bound to master complex piloting, firing at ground and aerial targets, bombing of small-scale targets on the battlefield, and to develop various methods employing their aircraft in combat.

The engineering and technical staff is faced with a formidable and exacting task. Engineers, technicians, and aviation specialists are obliged to study the aviation equipment entrusted to them, and to reach such a state that the aircraft serviced by them will always be ready for combat.

The rear service outfits are called upon to support in full the aviation units with everything necessary; to maintain the airfields and the facilities for safeguarding training and combat activities in constant operational readiness; to raise the level of discipline, order and organization.

Soviet soldiers are the heirs of the glorious and heroic traditions in which the history of our Armed Forces abounds. To preserve and propagate these traditions and to guard the Great October achievements vigilantly is the sacred duty of every soldier, a matter of his honor and dignity.

In response to the great faith of its people and of the great Communist Party, the personnel of the Air Force will raise the glory of our battle standards still higher.



Military Navigator First Class Maj. S. S. Korzhov has 53 commendations for successfully carrying out practice bombings on various targets. In the post-war period he has been honored with three government awards for success in combat training: the Order of Lenin, the Order of the Red Banner, and the Order of the Red Star. Communist Korzhov has been elected a member of the unit's Party bureau for the third year running.

In the photo: Maj. S. S. Korzhov (far right) tells his comrades about bombing results.
Photo by A. I. Dotsenko

V. I. LENIN ON DEVELOPING AND STRENGTHENING THE SOVIET AIR FORCE

Lt. Gen. of the Air Force
A. G. RYTOV

The building and strengthening of the Soviet Air Force as a component part of the Armed Forces of the Soviet State are indissolubly linked with the activity of the Communist Party and its great leader Vladimir Il'ich Lenin. V. I. Lenin left the Soviet people and their sage director — the Communist Party — a great theoretical heritage.

The great triumphs of October, the building and formation of the Soviet Army, Air Force, and Navy, the elaboration of questions pertaining to the military defense of the first socialist Fatherland in the world, and many other problems, were objects of special concern to V. I. Lenin.

In many of V. I. Lenin's works, in a number of his addresses at party congresses and conferences, at assemblies and meetings, in his military correspondence, and also in the practical work of directing the armed defense of the Soviet State, we see a creative application of Marxism in the military field and a skillful implementation of the basic principles of Soviet military science and military development.

On the basis of the law which he discovered concerning the unequal development of capitalism in the epoch of imperialism, V. I. Lenin came to the conclusion that it was possible for socialism to triumph first in one individual country.

The old world, warned Lenin, will not accept the triumph of the new order; the exploiting classes will make attempts to destroy the first socialist state in the world. In order to resist imperialist invasion, the state of the proletarian dictatorship, Vladimir Il'ich preached, must have powerful armed forces.

Building the Army, Air Force, and Navy of the Socialist State was an extremely difficult task, not only because earlier Marxists had never really raised this question even theoretically, but also because it had to be accomplished under conditions of extraordinarily severe fighting against foreign imperialists and a domestic counter-revolution.

One of the greatest services of our own Communist Party consists in that, under these very difficult conditions of devastation, starvation, poverty, and a severe class struggle, it was able to establish the basis of a new socialist military organization; to develop the fundamental principles for building the Soviet Armed Forces, including the Air Force; and to create a Red Army, Air Force, and Navy that were capable of crushing the external and internal forces of counterrevolution.

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Aviation long ago attracted the attention of V. I. Lenin.

Many documents attest to the fact that even in the early period of aeronautical development, he manifested a very lively interest in it as a new type of engineering. Even in his work "Imperialism As the Highest Stage of Capitalism", Lenin called attention to problems in the development of aeronautics and in the production of flying machines in the early twentieth century, emphasizing that this field had a great future. In 1916, summing up the results of studying the highest stage of capitalism, Lenin again turned his attention to the problems of aeronautics. In his works on the war of 1914-1918, he noted the applied military significance of dirigibles and pointed out that one of the special features of WW I was the movement of armies "for tens of versts at the request of fliers".

With the triumph of the Great October Socialist Revolution, the Communist Party and V. I. Lenin personally devoted considerable attention to solving the problems associated with establishing the Soviet Air Force.

As soon as Soviet power was established, Vladimir Il'ich directed all the work of the Communist Party in forming an Air Force.

On 28 October 1917, when the troops of Kerenskiy and Krasnov had captured Gatchina and Tsarskoye Selo, V. I. Lenin, arriving at the headquarters of the Petrograd Military District, gave orders to form a detachment of fliers immediately and to assign it to the corps airfield. Lenin's instructions were carried out. In the order of the day issued by the commander of the Petrograd Military District on 29 October 1917, it was stated: "...air units are to bring all combat machines to a state of combat readiness. Four airplanes are to be at the corps airfield at dawn and are to await orders."

In that same period, the first revolutionary unit of air administration — the Bureau of Commissars of Aviation and Aeronautics — was organized under the Revolutionary Military Committee in Smol'nyy. At the instructions of the Party's Central Committee, the Bureau immediately began to organize the defense of aviation materiel, to set up the first socialist air detachments, and to recruit for them reliable cadres devoted to the Revolution. In December 1917, there was created the All-Russian Collegium for Administering the Air Force of the Republic.

A decree of the Sovnarkom [Council of Peoples Commissars] concerning the formation of the Worker-Peasant Red Army, which was signed by V. I. Lenin, also served as the basis for forming regular air units in Petrograd, Moscow, and other cities of Soviet Russia, despite the opposition of some old specialists who insisted that creation of an air force was beyond the strength of the ravaged country.

An important role in the work of the first air units was played by the revolutionary military committees established by the Communist Party. They locally recruited flying and technical personnel for the units, protected these personnel from counterrevolution-minded officers, strengthened order and discipline, and inventoried, protected, and distributed aviation materiel. By the beginning of 1919, 61 air detachments had already been set up.

The quantitative increase in air units and the need for better utilization of them in combat on the fronts of the Civil War necessitated improvement in the agencies of administration. In place of the All-Russian Collegium For Administering the Air Force, a Main Administration of the Worker-Peasant Air Force was organized in May 1918 and local agencies of this Administration were set up in the districts.



The successes of Military Pilot First Class Capt. A. P. Samsonov in mastering new equipment have been distinguished by two government awards — the Order of the Red Banner and the Order of the Red Star. He skillfully accomplishes bombing of various objectives under adverse weather conditions. Communist Samsonov conducts considerable political education work in the sub-units. As secretary of the Party Bureau, Capt. Samsonov has done much to improve the quality of combat training of the personnel in the sub-units. All the Communists in the squadron are outstanding in political and combat training.

In the photo: Capt. A. P. Samsonov preparing for the next mission.
Photo by A. I. Dotsenko.

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In that same year, a Field Administration of Aviation and Aeronautics of the Army in the Field (Aviadarm) was formed under the RVS [Revolutionary Military Council] to direct the military activity of aviation and balloon units.

There are documents attesting to the fact that V. I. Lenin devoted great attention to the combat utilization of aircraft during the Civil War.

In the spring of 1918, American and Anglo-French intervention forces landed in the north of Soviet Russia. V. I. Lenin gave instructions that aircraft be used to help our troops in the fight against the interventionists. Although some aviation specialists thought that, inasmuch as there were no airfields in the north, aircraft could not be used, the local workers nevertheless carried out Lenin's instructions, and the fliers began successful action against the foreign usurpers. When the situation on the northern front became more serious, V. I. Lenin telegraphed M. S. Kedrov:

"You must now make up the losses, reach Kotlas, send pilots there immediately, and organize the defense of Kotlas at all costs."

In accordance with the instructions of the Party's Central Committee, the new air detachments were sent to the aid of the ground units at the Civil War fronts. Thus, a detachment of reconnaissance and fighter aircraft was sent to aid the defenders of Tsaritsyn, and help was given to the troops defending Astrakhan' under S. M. Kirov. On Lenin's initiative, the Sovnarkom strengthened the air units on the Eastern Front that were fighting Kolchak's army. With the active support of aircraft, the Red Army turned back the advance of the White Poles into the Soviet country. The Party's Central Committee sent aircraft to strengthen the troops on the Crimean front, so as to hasten the defeat of Wrangel.

In 1919, the breakthrough of General Mamontov's cavalry corps into our rear at the Southern front and the general advance by Denikin posed a serious threat to the Red Army. V. I. Lenin considered it imperative to eliminate Mamontov's cavalry at that time, and on 28 August 1919 he wired the RVS of the Southern front: "Extremely disturbed by Mamontov's successes. He may do us great harm by destroying roads and storehouses". On 4 September 1919, Lenin sent the following request to the Deputy Chairman of the Republic Revvoyensovet [Revolutionary Military Council]:

"(Cavalry is powerless against a low-flying airplane).

"... Can you not order military scientist X. Y. Z. to come up with an answer (quickly): airplanes against cavalry? Examples. Flying very low. Examples. In order to give instructions based on 'science'... Lenin".

At the personal behest of Lenin, a detachment of flight instructors from the Moscow Flying School was sent to fight against Mamontov's cavalry, and interceptor fighters and heavy bombers of the "Il'ya Muromets" type were sent into the battle, helping to hasten the defeat of Mamontov's cavalry.

Learning of the uprising in Kolchak's rear, V. I. Lenin directed the Air Force to maintain communication with the partisans and sent the following telegram to the RVS of the Eastern Front:

"I have learned... about the uprising in Kustanay and the advance of the insurgents against Chelyabinsk... All effort must be made to join up with them. What steps are you taking? Are you sending them an airplane? If there is no aviation fuel, we can probably get some by exerting pressure. Wire me in detail. Lenin".

In a number of memoranda and telegrams, V. I. Lenin pointed out the use of aircraft in the fight against banditry. On 11 June 1919, he wired to Simbirsk: "Pay

A. G. Rytov

special attention to the uprising in the Orenburg and Ural districts... consider whether the insurgents cannot be beaten by airplanes".

In 1921, Soviet pilots participated in the defeat of the counterrevolutionary bands of Makhno in the Ukraine and Antonov in the Tambov locale. During the suppression of the Kronshadt mutiny, the Air Force flew 137 sorties in three days.



IN BATTLES

FOR THE MOTHERLAND

At Kazan'

On 23 August 1918, the air forces operating near Kazan' were assigned to bomb enemy units in the area of Uslony. It was a foul day. The gusty wind, raising clouds of dust, literally tore the little "Nieuports" from their parking areas. However, this did not stop the pilots. Assigned to bomb the enemy were group commander I. U. Pavlov and pilot F. A. Ingaunis. After a run of no more than 30 m, the aircraft lifted off the ground and quickly climbed to an altitude of 600-800 m. The pilots held two bombs in their laps.



F. A. Ingaunis

In less than an hour, Pavlov and Ingaunis returned. Despite the difficult conditions under which the flight was made, they had fulfilled their mission.

During the Civil War years Ingaunis flew many such missions. For successful combat action in the area of Belgorod, he was decorated with the Order of the Red Banner in 1919.

* * *

In the Battles for Ufa

Red military pilots manifested great heroism in 1919 on the Eastern front, particularly in the battles for Ufa.

In the area of Ufa alone, more than fifty missions were flown. Particularly distinguishing himself was Military Pilot A. I. Tomashevskiy, who was decorated with the Order of the Red Banner for his part in this operation.

During preparations for this operation, he flew reconnaissance flights under severe weather conditions and at all times of day and night over entrenched positions occupied by Kolchak's units on the other bank of the Belaya River, and he invariably brought back valuable information for our command. During the forcing of the Belaya River and the storming of Ufa, Tomashevskiy flew a large number of

daring missions, dropping bombs and strafing the enemy with a machine gun.

In the photo: A. I. Tomashevskiy



V. I. Lenin suggested the idea of using aircraft to distribute propaganda material in the enemy's rear. In August 1920, the Leader of the Revolution sent the following memorandum to the RVS of the Western Front: "It is necessary to take all possible measures to distribute in Poland as extensively as possible the manifesto of the Polish Revkom [Revolutionary Committee]. Use our aircraft for this purpose".

Some time later he demanded that the RVS of the Western Front "... increase tenfold the propaganda from airplanes for Polish workers and peasants, that their capitalists are violating the peace and condemning them to purposeless bloodshed".

The Central Committee of the Communist Party and Vladimir Il'ich personally concerned themselves untiringly with improving the status of air detachments and with setting up a Bolshevik order within them. Following is a memorandum from Lenin to the Revvovensoviet of the Republic on 30 January 1919.

"A group of 8 aviators in the field army at the Tsaritsyn front, Red Air Fleet (23rd Balloon Detachment) — with chauffeur Baranov at the head (he was formerly in the 8th unit of the Special Balloon Division) — requests that an inspection be made, reporting that the air detachments exist only on paper and that the situation threatens catastrophe. Chairman of the SNK [Council of Peoples Commissars] V. Ul'yanov (Lenin)!"

The Council of Worker and Peasant Defense organized on 30 November 1918 with V. I. Lenin at the head considered for two years a multiplicity of diverse problems pertaining to improving the combat efficiency of the Air Force, to the training of Air Force cadres, to improving the supply of combat machines, to the repair of air-

craft and engines, to concentrating the air detachments at the critical sectors of the front, to the reconstruction and expansion of aircraft enterprises.

Among the orders, decrees, and regulations issued by the Sovnarkom over the signature of V. I. Lenin there are documents about releasing resources for reconstruction of aircraft plants and about the curriculum at the Moscow School of Aviation, about a plan for publishing aviation literature and about eliminating delays in paying the workers at aircraft plants, about improving the supply of aviation materiel for the front.

In a whole series of memoranda and telegrams, Vladimir Il'ich demanded that pilots, aircraft, fuel, and warm uniforms be sent to the front immediately.

In the works of the leader and in the decisions adopted under his direction the most diverse aspects of building and strengthening the Air Force were touched upon. Available materials attest to his great concern for the aircraft industry.

In 1918, at the direction of the Party's Central Committee and the Soviet government, much was done to reestablish the aviation enterprises and to expedite their repair and gear them up for production of aircraft.

On 17 January 1918 the SNK issued a decision with the signature of V. I. Lenin "On the Andreyev-Lanskiy Aircraft Plant", wherein it was stated that, in view of the fact that the management of the Andreyev-Lanskiy Aircraft Plant had refused to obey the government's decree, the Sovnarkom had decided to confiscate the said plant and all its appurtenances, whatsoever they may be, and to declare it the property of the Russian Republic.

A decree of 28 June 1918 nationalized all the repair and assembly shops and aircraft plants then in existence, and in late 1918 a center for administering these shops and plants (Glavkoavia [Supreme Air Force Command]) was set up within VSNKh [Supreme Council of the National Economy].

Not only did V. I. Lenin direct the work of the higher air institutions, but he was also closely associated with pilots and met with the workers of aircraft enterprises. And this helped him to be always aware of the most urgent needs of the young Soviet Air Force. For example, when receiving a delegation from the "Duks" Aircraft Plant, V. I. Lenin questioned them in detail about their work and their difficulties and then ordered that the plant be given assistance and be allocated resources for expanding its production of aircraft. He signed the statement of the Small Sovnarkom of 17 January 1921 granting credit to the Promvoyoysvet [Council of War Industry] for reestablishing Aircraft Plant No. 6.

Despite the enormous difficulties in the country, the Communist Party and the Soviet government created all the conditions necessary for the growth of aviation science. Even during the Civil War, several teaching and scientific aviation research institutions were organized. V. I. Lenin concerned himself with the prospering of aviation science and supported the scientists in every way, as is evidenced by the well-known resolution (signed by V. I. Lenin) of the Council of Peoples Commissars of 3 December 1920 which was adopted in commemoration of the fiftieth anniversary of Professor N. Ye. Zhukovskiy's scientific activity. In this resolution it was resolved:

"1. To relieve Professor N. Ye. Zhukovskiy from mandatory lectures, granting him the right to give courses of greater scientific importance.

"2. To give him a monthly stipend for maintenance to the amount of one hundred

thousand (100,000) rubles, with all subsequent wage scale increases to apply to this stipend.

"3. To establish an annual N. Ye. Zhukovskiy prize for the best work in mathematics and mechanics.

"4. To publish the works of N. Ye. Zhukovskiy."

At the direction of Lenin, TsAGI—the Central Institute of Aero-Hydrodynamics—was established in December 1918; this was later to become a strong scientific center for modern aircraft building.

After the victorious conclusion of the Civil War, peaceful construction developed throughout the country. Restoring the national economy, the Communist Party did not relax its efforts to strengthen defense.

A number of measures for strengthening aviation were adopted. On 26 January 1921, the Council of Labor and Defense adopted a decision to work out a program of aircraft building. In that same year, three million rubles in gold were allocated for the development of aviation, and a plan for expanding aircraft plants was worked out.

The Tenth Party Congress in its decisions for building the army, together with other special technical units, devoted considerable attention to strengthening the air units. The Congress defined the tasks in the development of aviation, pointing to the need for increasing the proletarian personnel in the ranks of aviation, for improving the political and combat training of airmen, for providing the units with all the things necessary for combat and for daily life.

In 1922 the Council of Labor and Defense adopted a three-year program of expansion of aircraft enterprises.

It is well known that, shortly after this, Soviet designers N. N. Polikarpov, D. P. Grigorovich, and A. N. Tupolev began building the first Soviet aircraft.

All this shows that the Communist Party and the Soviet government created the necessary conditions for and defined the basic trends in the development of the Air Force.

Concerned with aviation cadres who could be entrusted with the defense of the young Soviet State, the Party sent Communists to flying schools and to enroll in aviation courses.

The First Moscow School of Aviation, the Petrograd Higher Military School, the Higher Aerophotogrammetry School, the Moscow Aviation Technicum, and, later, the Air Fleet Academy, all trained aviation specialists — commanders, pilots, observers, and engineering-technical personnel.

Vladimir Il'ich was very solicitous of Air Force cadres. For example, as Chairman of the Council of Defense, on 3 May 1919 he telegraphed the Minsk Provincial Military Commissar and the Provincial Party Commissar:

"Pilot observer Fedor Aleksandrovich Armand of the 38th Air Detachment is known to me personally and merits trust, although he is a former officer and is not a Communist. Request Red Army comrades and commissars not to hold him in suspicion."

Because of the great concern for aviation on the part of the Communist Party and V. I. Lenin personally, aviation cadres devoted to the Revolution were nurtured in the country; very soon in the air units there were strong Party organizations that united the personnel of the units in the Air Fleet around the Communist Party and

the Soviet Government.

Like the entire people, the aviators knew and loved Lenin. The following attestation can be presented as evidence of their ardent love for him:

"The bearer, Chairman of the Council of Peoples Commissars of the RSFSR Vladimir Il'ich Lenin is in fact an honorary member of the Red Fleet of the aeronautical units of the Kiyev Military District, as attested to by the signatories with the seal hereon affixed".

Following Lenin's precepts, the Communist Party has been and still is unremittingly heedful of strengthening the Soviet Armed Forces, including the Air Force.

Relying on the advantages of the Soviet social and state structure, the Communist Party has been able to inspire our people to a heroic struggle for the universally historic economic reformation of Russia. Carrying out the brilliant Lenin plan for industrialization of the country and for cooperation of rural economy, the Soviet people have been able to alter the face of their Motherland in a very short time. History has never known such a mighty volume and strenuous rate of development in all sectors of the national economy, particularly in heavy industry — the very basis of the entire economic structure.

Rapid expansion of industry, primarily of heavy industry, has been the key to socialist reformation in the country and an important factor in the flowering of culture, science, and technology. On this basis, the Armed Forces have received new and modern combat equipment in the necessary amounts, as well as competent personnel. Our Army, Air Force, and Navy have been transformed into a formidable and invincible force that is capable of curbing any aggressor.

Of particular importance for aviation has been progress in technology and aviation engineering thought, which were matters of constant concern to V. I. Lenin.

The Communist Party has not spared resources or efforts in establishing an aircraft industry. By the tenth anniversary of October, the country had already managed to reestablish and expand its aircraft enterprises, and to establish scientific research centers which have greatly promoted the growth of air might. Aircraft of Soviet design and manufacture began to flow to the Air Force. And ten years later, our aviation spread wide its mighty wings and undertook to take by storm the world records for distance, altitude, and speed of flight. By the end of 1939 the USSR took first place in the world in respect to the number of international air records established. Many of these records were achieved by ordinary series-produced aircraft. This served as strong evidence of the high quality of our native technology, of the courage, bravery, and masterful skill of Soviet fliers who stand ready at any moment to answer the call of the Party and the people in defense of their Motherland.

The Great Patriotic War was a severe test for our Motherland. During the war, however, under difficult conditions the Communist Party managed to reorganize and increase the production of aircraft, supplying air units with first-class fighting machines. Also improved was the organization of the Soviet Air Force, which, like the entire Soviet Army, came through the test of the war even more hardened and stronger.

The guns of battle were still thundering at Leningrad and Rostov-on-Don when Test Pilot Communist G. Ya. Bakhchivandzhi flew a fighter aircraft with a liquid-fuel jet engine. This was the beginning of a new era of jet aircraft.



Officer Yu. G. Mishchenko has proved himself to be a master of aerial combat and of sniper fire at aerial targets. His high achievements in political and combat training have already been described in our journal. In the latest aerial gunnery competition, he again won individual first place, confirming his high rating as a fighter pilot.

In the photo: Capt. Yu. G. Mishchenko.

Photo by V. I. Kolesnikov



IN BATTLES FOR THE MOTHERLAND

Bold Reconnaissance

It is August 1919. Mamontov's cavalry in the area of Tambov is preparing a breakthrough on the Southern front. In order to take countermeasures and to smash Mamontov's troops, it is necessary to have precise information on their movements and their numbers.

At the disposal of the front command there is only one old "Voisin" airplane; there is no fuel and, above all, there are no pilots. In the staff there is pilot I. I. Petrozhitskiy, but he is wounded in the hand, he cannot use his wrist. Despite this, the pilot requested permission to make the reconnaissance.

The plane is quickly repaired, it is fueled with kerosene because there is no good fuel. Petrozhitskiy ties his wounded hand to the control stick and opens the throttle. After several unsuccessful attempts, the plane finally takes off and climbs to an altitude of 900 meters.

More than three hours have gone by, the fuel is low, the wounded hand aches unbearably, and the enemy's cavalry is still not to be seen. But the courageous pilot has no thought of returning until he gets the necessary information.

When all hope for success was almost gone, Petrozhitskiy suddenly saw the black columns of the enemy cavalry moving to the north of him. He was barely able to count the number of the enemy when his motor died out, and the Cossacks, spying the plane, began shooting at it. With difficulty, Petrozhitskiy started the motor and flew into a cloud hanging low over the ground. A few minutes later the motor died out again. Ahead could be seen a railroad line. Gliding in that direction, the pilot landed the plane beside a flag station. Luckily, there was a telephone there, and he transmitted to the staff the information he had gathered.

For this bold reconnaissance flight and for reconnaissance he made a few days later, I. I. Petrozhitskiy was awarded the Order of the Red Banner.



The war ended with a universally historic victory for the Soviet people, led by a sage helmsman — the Communist Party. Healing the wounds of war in a short time, our people made an epic advance on the road of glorious victories toward the building of Communism: they are building scores of mighty hydroelectric power stations, blast furnaces, mines, factories, and plants; they are developing millions of hectares of virgin and fallow lands; they are building the first atomic power station in the world; and, finally, they are launching artificial earth satellites into space. These great landmarks of historic triumphs denote the vitality of the socialist system, its indisputable advantages over moribund capitalism!

The postwar years in aviation have been years of unparalleled technical progress, years of high speeds, great flying range and altitude. New discoveries, new achievements in mastering modern equipment constitute a veritable technical revolution in aviation.

Our Air Force is now equipped with thoroughly modern jet fighters and bombers. The Soviet Union has intercontinental ballistic rockets and other types of modern armament. Planes are flying ever faster, higher, and farther. The so-called sound barrier has been left far behind; jet engines have been mastered; in immediate prospect are better aircraft and engine designs. Inspired by the daily concern of the Communist Party, our scientists, aircraft workers, pilots, navigators, and aviation specialists are working resolutely toward improving the combat capabilities of our Air Force.

Following Lenin's precepts, our Party has trained outstanding Air Force cadres who are illimitably devoted to their Motherland, the Communist Party, and the Soviet Government. The Party has reared a galaxy of renowned Soviet scientists, aircraft designers, and engineers.

Carrying out Lenin's behests, the Communist Party and the Soviet people are doing everything necessary to strengthen from day to day the Air Force that is vigilantly guarding the peaceful creative work of the Soviet people.

A profound and comprehensive study of Lenin's military legacy serves to improve the theoretical military training of our cadres, to increase their Marxist temper. In the works of V. I. Lenin there are answers to many questions on the character and purpose of the Air Force. The Leninist principles retain their validity even under present conditions. Using them as a guide, our Party is doing considerable work to further strengthen the Air Force, ensuring the development of aviation at the level required for the safety of our own socialist Fatherland.



Against the Black Baron



Maj. Gen. I. K. SPATAREL' (ret.)

(From the Notes of a Participant in the Civil War)

A leaden thundercloud covered half the sky, blew a gust of raw wind, and raised whitecaps on the grey Dnepr.

The wind fluttered the red calico standard. A formation of pilots and mechanics stood at attention before two airplanes. They were all we had left after incessant battles.

In front of the formation stood the Air Group Commissar Savin. As he spoke he beat the air violently with a tightly clenched fist:

"The international bandits are gloating maliciously. But it is still early. Our Thirteenth Army is not destroyed. It trusts that the eagles of the proletariat — the Red pilots — will help it in forthcoming bloody battles. An attack on the Black Baron is approaching. Death to Wrangel the hangman!"

With a deft soldierly motion, the Commissar smoothed out his blouse under his belt and continued:

"The commanding officer and I have consulted and have decided to give the best plane to the best young pilot. The commander will have little chance to fly now. We must procure new planes and must organize the work of our air detachments and bases located far from the main body of the group. So, in order that the commander's 'Nieuport-24 bis' does not stand idle, Nikolay Nikolayevich Vasil'chenko will use it for a while..."

Vasil'chenko's gaunt face flushed crimson.

"And remember", continued Savin, "the commander will give the new machines to those who merit them in combat."

It got darker. A sharp gust of wind came along. The thunderhead was already directly over the airfield.

"The flag to headquarters! Everybody to the planes! Make them fast! On the double!", I yelled, and saw Vasil'chenko's light and nimble figure dash to the "Nieuport!". A stupendous flash of lightning lit up the city, the river, the steppe, and the men standing around the planes. A clap of thunder split the heavens...

This was in June 1920 when Wrangel's troops had succeeded in breaking through the front. As a result of battles, the 16th Air Detachment and the combat flight of the 48th Detachment — both of them a part of our Air Group — were without planes

and had gone to Zaporozh'ye for replacements. The main body of the group — the Second Fighter Battalion — had been attached to the Pravoberezhnaya Group of the Thirteenth Army and had been moved to the Novo-Kamenskiy farms.

Wrangel's attempt to smash the Thirteenth Army did not succeed. The offensive cost General Kutepov's corps heavily; he lost 30% of his personnel in combat.

Ivan Konstantinovich Spatarel' is the oldest Russian pilot. He has served in the Air Force since 1910.

During WW II Spatarel' served in the Second Air Combat Group which was commanded by the renowned fighter pilot Yevgraf Kruten'.

The Great October Revolution broke out. I. K. Spatarel' was elected chairman of a soldiers' committee, and he directed all the work of the Air Group toward supporting the Soviet regime. Soon, on orders from the Revkom [Revolutionary Committee] of the Eleventh Army, Spatarel' in company with other pilots flew a number of liaison and agitational leaflet raid missions.

In 1918-1920, I. K. Spatarel' participated actively in battles against the White Guardists. The Air Group that he commanded played a significant role in routing Wrangel.

During the Great Patriotic War, Maj. Gen. Spatarel' (see photo) worked selflessly in supplying combat units with new air equipment.



During the retreat, the Air Group carried out assignments in protecting the units crossing the Dnepr. The command did not forget the work done by the Group and soon sent two "Nieuports". We repaired one more ourselves. Thus, by 1 July there were already five operational machines. In the daytime, two or three pilots flew in turns in each plane. At night, the technicians and mechanics patched up the shell-holes and repaired the engines.

The Pravoberezhnaya Army Group was confronted with the task of not only keeping the Wrangelites off the right bank of the Dnepr but also of establishing a bridgehead on the left bank for an offensive against Perekop.

At dawn on 1 July the men and officers of the 52nd and the Latvian Divisions waded into the still-warm Dnepr. And when the first shots rang out, aircraft with Red Stars appeared in the sky. They attacked the batteries and concentrations of the Whites.

The machines were on the ground only long enough to replenish their fuel. Spelling each other, Skaubit, Bylinkin, Vishnyakov, Gulyayev, Vasil'chenko, Zakharov, Al'tdorf, Datsko, and others took off. They reported to the staff the slightest movements, regroupings, and maneuvers of the enemy, plotted on the map the camou-



N. N. Vasil'chenko upon graduation from the Moscow Flying School in 1920.

famous airman, Capt. Kruten', under whose command I had been lucky to serve at one time. I could see how Vasil'chenko seized the best our experienced pilots had to offer, creatively applying their battle methods.

The Commissar approached me. His hands were covered with oil; he had been helping to repair an engine.

"Ivan Konstantinovich, he is overdue. Has something possibly happened to Vasil'chenko?"

I didn't have time to reply.

"He's coming! Vasil' is coming!" shouted his mechanic.

Savin and I looked towards the east. It was true. Low over the ground, at an altitude of about 50 meters, the "Nieuport-24" was approaching. But what had happened to it? The upper left wing was shattered and the elevator was hanging loose. Somehow the plane landed on the airfield.

We ran up to where it had landed. Vasil'chenko climbed out of his cockpit to meet us. He looked terrible. He had a guilty look.

"Comrade Group Commander", he reported, "Red Army Pilot Vasil'chenko has completed his mission." And suddenly, he concluded in a broken voice:

"Sorry, I didn't safeguard the plane!"

flagged White batteries, and patrolled the area where the pontoon bridge was being laid.

The crossing of the broad Dnepr was made successfully. Our troops seized Kakhovka and the Korsun'skiy Monastery, capturing prisoners and machine guns. But they were unable to expand the bridge-head on the left bank.

During these anxious days I mapped out three principal reconnaissance routes covering the entire battle area and the enemy's operational rear. Twice each day flights were made over these routes, giving a comprehensive picture of the position of Wrangel's troops. The fliers "combed" the entire front line along the Dnepr in the Nikopol'-Berislav-Kherson sector, an overall distance of 200 km. In depth, the enemy's rear was reconnoitered for 100 km.

Always eager to go out on a mission and having obtained the "Nieuport-24 bis", Nikolay Vasil'chenko was now quite ready to stay in the cockpit all the time.

It was gratifying to see how this true eagle-pilot spread his wings. He often asked about air battles of the World War, about the tactical combat methods of the

Together with the mechanic we examined the plane. The left upper wing had been hit by a machine-gun burst. The fuselage longeron brace near the elevator was smashed. The entire machine had been riddled with bullets.



IN BATTLES

FOR THE MOTHERLAND

Above Zaozernaya Heights

A battle for the Zaozernaya heights was being fought with the Japanese invaders. Aircraft came to the aid of our ground troops. The air was filled with the drone of motors.

The Soviet bombers had just dropped their bombs. The Japanese AA guns were firing madly at a group of fighters following the bombers. The fighter piloted by young Lt. Ivan Kukin was surrounded on all sides by flak. But Kukin, diving boldly on the Japanese positions, poured over them bursts of machine-gun fire. However, there were too many emplacements. Other fighters came to Kukin's assistance.

The attacks of the Soviet aircraft did not stop. The samurai fled for cover in terror. But the AA fire was still strong, and Kukin tried a ruse. He put his plane into a spin, as though he were about to crash. Thinking that the most intrepid Soviet fighter had been put out of action, the enemy AA men stopped firing.

That was all Kukin needed. Quickly pulling out of the spin, he dove on the AA positions in a strafing run. One more enemy AA battery in the area of Lake Khasan was destroyed.

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Soviet airmen gave our ground forces vital assistance in the defeat of the Japanese units in the area of Lake Khasan in the summer of 1938. More than 70 fighter aircraft and 120 medium and 60 heavy bombers made attacks against the enemy positions. Our fliers carried out their missions with honor.

This is how it happened. Returning from long-range reconnaissance, in the flats of the Dnepr near Bol'shaya Lepetikha, Vasil'chenko saw a horse standing without a rider. "Where there is a horse, there should also be his master," thought the flier and reminded himself that in reconnaissance there are no insignificant details. But there was only twenty minutes of fuel left. What to do? Return to the airfield without finding out anything? No. He turned the plane back toward the flats. The twisted shrub growth and thick reeds came closer and closer. His heart beat faster and faster. His eyes scanned every thicket. From an altitude of 100 meters everything was as plain as the palm of one's hand. Suddenly, there appeared a whole flotilla of boats hidden behind the reeds on a sandbar. Further up on the shore, in a clump of old willows, was a troop of dismounted cavalry, about 150 men. Realizing that they had been discovered, the Whites began stirring. Turning into the attack, the pilot could see rifles aimed at him; the upraised barrels of machine guns were gleaming. Turning his plane into the very thick of the enemy, Vasil'chenko pressed the trigger. In response, there was the flash of a return volley. He saw horses dashing around, men in green British tunics falling.

After the third low-level run, literally just above the ground, the White Guardists scattered in panic. The horses went wild with fear. Several score of the enemy had fallen in the reeds and in the sedge along the shore. The rest fled pell-mell in every direction.

Only then, heading for the airfield, did Vasil'chenko notice that the plane was not responding to the elevators. He could see that the upper left wing was damaged. The engine was barely pulling on the last few drops of fuel.

It was learned later from a prisoner that the detachment which was crossing at Bol'shaya Lepetikha had been designated to make a surprise foray against the Novo-Kamenskiy farms with the objective of a night attack on the airfield.

... One of the most daring airmen of the group was V. F. Vishnyakov. This is how Vasya Vishnyakov, a pilot from the ranks who had attended the Sevastopol' Flying School with me in 1911, came to fight against the White Guardists.

On the World War front he had been decorated with two "Georges" for extraordinary valor in aerial combat.

When, after the October Revolution, the old army fell apart and a spontaneous demobilization began, Ensign Vishnyakov returned to his native village.

Oh, how lovely his native Tver' soil seemed to him after the war... Beyond compare was the feeling of delight with which he greeted the morning as he walked behind the plow. How rich was the furrow of black earth turned by the plowshare! How buoyantly and steadily the horse pulled! How wonderful all this was after the front!

But when the Civil War began and the Republic was inclosed in an iron ring of interventionists, Vishnyakov voluntarily came to the airfield.

He came as he was, like a young peasant lad after a long journey: bareheaded, with his unbelted sateen shirt hanging out, and barefooted. Brand-new boots dangled together with a small bundle from a cane over his shoulder. No one believed him when he said he was a pilot. I winked to Vasilii Fedorovich, indicating my "Nieuport". Still barefoot, he jumped right in the cockpit.

When he laid the plane on its wing right at takeoff and pulled it up in a climbing spiral, everyone gasped. He made a couple of loops. And then he landed. And what a landing! It was exceptionally beautiful. The plane dropped smoothly, almost imperceptibly. Gently the wheels touched the ground. And the minute the tail skid touched, the plane stopped.

That is how Vasilii Fedorovich came to fly in our 5th Air Detachment.

It was a dark Ukrainian evening. A bonfire crackled brightly, fed with waste oil and old rags. Around it sat the pilots. The Commissar was reading a letter from the Central Committee of the RKP



V. F. Vishnyakov

(b) [Russian Communist Party (Bolshevik)]. His voice was fraught with emotion and import:

"For the immediate future, the attention of the Party must be concentrated on the Crimean Front... It must be explained to every worker, every Red Army man that a victory over Poland is impossible without a victory over Wrangel. The last bulwark of the Generals' counterrevolution must be destroyed."

Savin smoothed out the folds of his blouse under his belt (he always repeated this gesture when deep in thought).

"Now here's what I have to say, dear comrades, Red Army pilots! We must chop at the roots of the international bandits the way Vishnyakov, Vasil'chenko, and Zakharov are doing. This is how they do it," and the Commissar began to read reports from the infantry commanders on the results of the fliers' actions (he traveled for these reports to the headquarters of the Pravoberezhnaya Group).

It would be difficult to devise better combat propaganda. Everyone saw the real usefulness of his own work, felt the very breath of the front lines, sensed a deep bond with those who sat in the trenches with a rifle...

Formerly a machinist and a soldier in the World War, Savin enjoyed the love of the entire detachment. A wealth of practical experience and a profound love for the Bolshevik party helped him to solve the most complex problems, to understand the international situation, the domestic life of the country, and matters of the front. He was always with the men, and they always felt that he was their comrade.

I thought of Savin as a very close friend and an astute political leader. His daily counsel and his work with the men helped me very much. The pilots listened to him with close attention.

The fire was going out. A lively discussion of our combat activity, into which

Savin had drawn everyone after the reading of the letter from the Central Committee, was coming to an end. Without a doubt, the results of the discussion would soon show up in our combat missions.



IN BATTLES

FOR THE MOTHERLAND

The Strong of Heart

It was the summer of 1939. Soviet troops had gone to the aid of the Mongolian Peoples Republic to repulse the outrageous provocation of the Japanese invaders on the Khalkhin-Gol River.

Bitter battles were raging on the ground and in the air. Col. Kutsevalov was leading a flight of Soviet fighters to meet the enemy. Suddenly, a single enemy plane boldly darted out at them from behind some clouds. Kutsevalov easily surmised the cunning of the samurai — to break up the formation of Soviet fighters and then attack them with a whole group — and quietly gave the command to a few pilots to destroy the solitary enemy plane. Bursts of machine-gun fire raked the hostile scout plane. Smoking, it crashed to earth. And in less than a minute, as Kutsevalov had guessed, two flights of planes appeared simultaneously above and below. But the samurai had made a grave miscalculation. The top group was already late, and its attack aborted. An aerial dogfight began with the bottom group.

The battle was fought at an altitude of three to four thousand meters. With an unbearably bright sun in the sky, the fighters could not be seen. Only the roar of climbing and diving planes could be heard. The results of this encounter could be judged only by the number of falling machines.

Thirty minutes of tense fighting ended in victory; 16 of the enemy planes were shot down. The rest fled in disorder from the field of battle.

The Japanese pilots that were taken prisoner that day said in their interrogation that their best pilots had perished in this battle.

* * *

A Second Gold Star

G. P. Kravchenko (right) and S. I. Gritsevet's were awarded their second "Gold Star" medal for extraordinary heroism in the battles against the Japanese imperialists at the Khalkhin-Gol River in 1939.



In early July preparations began along the entire front for an offensive against Wrangel. The Pravoberezhnaya air forces were reinforced by the 49th Air Reconnaissance Detachment, whose planes and experienced pilots lead by Detachment Commander Polyakov increased the combat capability of the group considerably.

On each mission the fighter pilots carried 2-4 ten-pound bombs. From low altitudes they strafed the enemy with machine guns. Every day there were air battles, especially violent ones in the area of the Apostolovo Station — the central supply base for the troops on the right bank. Flying patrol above the station and the probable routes of the White Guardist planes, our pilots drove off the enemy in the air with bold attacks, protecting the troops and the railroad trains.



I. T. Datsko after graduation from the Moscow Flying School in 1920.

In early August the Red Army began an advance along the entire Polish front. The final preparations for an advance against Wrangel were also being completed. By that time the Air Group already had seven "Nieuports", two "Spads", and a two-place reconnaissance plane. They were making a continual and thorough reconnaissance of the left bank of the Dnepr. On 5 August the commanding officer of the 52nd Infantry Division went up as an observer with veteran pilot Kish. This division was to be the first to start the new attack. The commanding officer went up to study the approaches and the enemy's firing positions and defensive lines. During the night of 6-7 August the ground troops began forcing the Dnepr. As was to be expected, they met with stubborn resistance on the part of the White Guardists.

All the planes were in the air. From morning until evening the pilots were making reconnaissance flights. Completing their missions, they would land at Berislav where the headquarters of the Pravoberezhnaya Army Group was located and reported personally to the commanding officer on the results of their reconnaissance. Continual patrolling by our fighters prevented the White Guardist planes from penetrating through to Berislav or Kakhovka. Even on 7 August at the very peak of the battle, the hostile pilots were unable to drop a single bomb on the advancing units of the Red Army.

During the night of 7-8 August, I received orders to move the Air Group to Berislav, closer to headquarters and the battle area.

The first to chalk up a score from the new airfield was Vasil'chenko, who forced a hostile battery to stop firing. The enemy barely managed to pull two other guns out of their positions to Bol'shiye Mayachki. In addition, Vasil'chenko dispersed a cavalry troop.

An unexpected rainstorm came up in the evening. The wind velocity at ground level was 25 meters per second; violent gusts raised sandspouts of river sand and tore the thatched roofs off huts. At that very moment, in the dark sky appeared the plane piloted by Vasil'chenko who was returning from his third flight of that day.

His "Nieuport" was being tossed around like a sliver of wood. It was impossible for him to come in for a landing.

"Now what in the world is this," Savin repeated several times, not taking his eyes off the plane which was battling against the storm. Every one thought the "Nieuport" would be dashed to the ground and nothing would be left of it. But suddenly, inexplicably, almost right out of a turn, the plane dove down and touched the ground. Ivan Datsko and the Commissar dashed toward it, the others after them. They grabbed the wings, the tail, and held the machine. Out of it climbed Vasil'chenko, smiling sheepishly.

Never, as long as I live, will I forget that amazing landing!

The headlong advance of the Red divisions toward Perekl' alarmed the enemy and he decided to move armored cars and Gen. Barbovich's mounted corps into the Kakhovka area.

During the night of 9-10 August this corps withdrew in deep secrecy from the front at Bol'shoy Tokmak and moved by forced march to the rear of the advancing Red regiments. And who knows what turn the events at Kakhovka would have taken had it not been for the Red air force?

On the morning of 10 August Pilot Krekis and Air Observer Zolotov of the Central Air Group discovered in the Veseloye-Deka area a column 20 km long — cavalry with artillery and combat trains. Within an hour, the commander of the Thirteenth Army knew of this.

On 11 and 12 August Vasil'chenko and Zakharov made reconnaissance flights on my orders. They fully confirmed the reports from the pilots of the Central Air Group, showing that the columns were moving by field and country roads rather than by the main roads. In addition, they established that the main enemy forces, located in the village of Antonovka, had up to 10 artillery batteries, up to 2000 sabers, and 4000 infantrymen in vehicles. Thus, the appearance of Barbovich's corps was not a surprise to us.

The engagement at Kakhovka assumed great proportions and therefore the Central Air Group, under the command of I. U. Pavlov, was also thrown into the battle for the bridgehead. The planes of this group occupied our old airfield at the Novo-Kamenskoy farms.

... Over the pontoon bridge across the Dnepr stretched a long column of our troops moving off toward Kakhovka. Cannon fire could be heard from that direction. A messenger ran up to me.

"Comrade Commander! They telephoned from the observation post that White planes are coming!"

I saw Commissar Savin skillfully adjusting a machine gun for shooting upward. There were no planes to send against the Wrangelites. Of the three in working order, two were out on reconnaissance in the enemy's rear, the third had just returned and was not yet ready for takeoff.

There they were! Clearly visible in the sky were seven White Guardist "de Havillands". They were flying in formation. Ever louder sounded the characteristic monotonous drone of their stationary engines, the sound of which was so different from the murmur of the rotary "Rhones" installed in the older "Nieuports".

There was a congestion at the crossing. The bridge was jammed with Red Army men...

The seven enemy planes went into their bombing run at an altitude of 800 meters.



IN BATTLES FOR THE MOTHERLAND

Life is an Exploit

"As long as I have a heart, a voice, eyes, hands, I can be useful; I want to serve you, my own Soviet people..."

So spoke Hero of the Soviet Union Military Fighter Pilot Leonid Georgiyevich Belousov, once addressing the students at the Baltic Naval School.

Belousov's entire life has been one of self-sacrificing and unselfish service to the Motherland. On a stormy wintry night in 1938 at one of the border airfields, the young pilot Belousov, returning to his home field after pursuing a plane that had violated the border, suffered an accident on landing. The plane caught fire from a gasoline tank that exploded. Very severe burns on the face, the arms, and the legs had, it seemed, put this flier out of commission for good. But this was not the case. When the action against the White Finns began, the still convalescent Belousov could be seen in a squadron of fighters at Leningrad. During those months, he carried out a number of important missions.

Came the war against the German fascists. It found Belousov on the border at the Khanko Peninsula, at Ganguta, where things were not only difficult but also very dangerous.

It was the winter of 1942. Guards Major L. G. Belousov was the deputy commander of a fighter regiment on the Leningrad front, at Ladoga. This regiment was soon designated a Guards regiment.

One time, on a long flight, Belousov froze his legs — which were once severely burned — and gangrene soon set in. But this uncommonly courageous man, even under the surgeon's knife, even after both his legs had been cut off, dreamed of only one thing: to fly again without fail!

In the spring of 1944 Leonid Georgiyevich was again in action. His war comrades helped him to fly again. Guards Major Belousov fought the Fascists until the end of the war.



L. G. Belousov

Their target was the river crossing. The confluent drone of their engines filled the air. They were about to drop their bombs! Suddenly I saw a small "Nieuport-17" diving from above like a hawk on the leading "Havilland". The hollow sound of machine-gun fire could be heard. It was Vasil'chenko who had returned from reconnaissance.

The plane under attack dove in a bank. His wingmen scattered. One to the left, the other to the right. The rest dispersed. The group of aircraft, a moment ago flying in combat formation, had been broken up.

Over the thousands of fighting men on the Kakhovka bridgehead, over the residents of Berislav, over the headquarters of the troops in the line of advance on the right bank there developed an unforgettable picture of an unequal air battle. On one side, seven new, two-place English planes with 14 machine guns, on the other, an old "Nieuport" with a single machine gun.

Vasil'chenko pursued the leading enemy plane. The observer on the "de Havilland", wounded or dead, hung like a sack from his safety belt. Enjoying an advantage in speed, the pilot tried to elude the attack. Coming to their senses, the other White pilots hurried to the aid of their commander, and suddenly three of them attacked Vasil'chenko's plane from the above rear.

Throwing his machine into a steep combat turn, Vasil'chenko went over to the attack himself. A short burst of machine-gun fire could be heard. One of the three Wrangelite planes fell sharply. Losing altitude, he glided toward his own territory and fell beyond Bol'shaya Kakhovka. The second of this trio, declining battle, also headed for home at top speed.

At that moment the commander of the White Guardist group unexpectedly attacked Vasil'chenko from the side. Vasil'chenko threw his "Nieuport" into a spin. The enemy pilot in his heavier plane simply could not get him in the crosshairs of his sight. Suddenly, intent on pursuit, the Wrangelite found himself below Vasil'chenko. An instantaneous recovery from the spin — and then a dive on the enemy. The two tangling planes, joined in mortal combat, rolled around the sky. Meanwhile the four remaining White Guard planes dropped their bombs pell-mell in the Dnepr and fled.

Vasil'chenko's battle with the commander of the Wrangelite air group continued for more than 25 minutes. Finally, coming out of a turn on the tail of the "de Havilland", Vasil'chenko at almost point-blank range gave him his last burst. His ammunition was all gone. The enemy plane first nosed up unnaturally, and then, with a sharp drop, turned toward its own lines trailing a plume of smoke. Vasil'chenko hovered over it, following it until it fell to the ground. Unfortunately, that was already behind the front lines.

At an altitude of 100 meters, Vasil'chenko's "Nieuport" flew over the crossing, on its way home. And then, after the nervous tension they had gone through and after the anxiety for the life of the daring pilot, everyone who had watched this air battle was gripped by a feeling of utter delight.

Excited, still heated from the fray, Nikolay Vasil'chenko walked rapidly toward me. His helmet was shoved back on his head. His eyes were ablaze. "Comrade Commander..." he began, throwing up his hand in a salute. "Oh, my dear Vasilek!" I interrupted him and, words failing me, embraced and kissed him.

The commanding officer of the Pravoberezhnaya Army Group arrived and warmly gripped Vasil'chenko's hand.

The result of this brilliant air battle was that the Kakhovka crossing was saved. For this battle, Nikolay Nikolayevich Vasil'chenko was recommended for a Golden Arms award. The example of daring displayed by this pilot was deeply imprinted in the memory of the men at the bridgehead.

Only half a year had passed since Nikolay Vasil'chenko arrived from school, but his chest was already decorated with two Orders of the Red Banner. The first was for an aerial photoreconnaissance of Perekop, and the second for intrepid air battles. Half a year at the front is a good deal. Some peaceful person in ten years of life will not learn, will not experience as much as can be gained from a few months of hot fighting.

Wrangel understood very well the danger in the Kakhovka dagger. And a dagger it was, directed at his back. Whatever action he might take on other fronts, he could not forget Kakhovka.

On 12 August two White corps, supported by air units, began storming the bridgehead. Groups of enemy planes flew over the area where our troops were located several times a day, but they were rarely able to drop their bombs on their objectives. Warned from observation posts, I scrambled the planes that were on duty, and they managed to intercept the enemy. There was not a single instance of the Wrangelites carrying out their mission when our fighters were in the air.

...It was about 8 o'clock in the morning; most of our planes had just landed after completing their first sortie and the others had gone out on missions. The mechanics were tinkering with the engines of the planes that had returned. The pilots had gone to the mess hall for breakfast. We had just sat down at the table, when the distant drone of a "Havilland" was heard.

Everyone ran outside where the trucks were standing. Before we could blink an eye, the Commissar had already set up a light machine gun. But he had no chance to fire: the plane was flying at an altitude of 1200 m and a machine gun couldn't reach it.

From then on everything happened at once. The Wrangelite plane appeared in a break in the clouds. Then came the whistle of a bomb. An explosion!

The hot breath of the explosion hit me in the face and I was thrown back by the blast wave. Savin fell with his machine gun. Datsko collapsed as though cut down.

When I came to, my first thought was of Savin. I bent over him. My dear Commissar! He still lay there with the machine gun cradled in his arms. I picked him up and carried him inside...

In the evening of that same day, two enemy planes, taking advantage of the cloudy weather and undetected by the observers, crossed the front line and, reaching Berislav, began searching for a break in the clouds to bomb the airfield.

Yakov Gulyayev was in the air at that time. Spying the "de Havillands", he headed directly toward them. His "Nieuport" dove under the cloud base. "I must come out right behind the enemy planes," decided Gulyayev, "no sooner, no later; otherwise they will get away."

The seconds of waiting were agonizing. Finally, two black shadows flashed 100 m above the plane. Gulyayev pulled on the stick; a combat turn, and he was "sitting"

on the tail of the leading "de Havilland".

IN BATTLES FOR THE MOTHERLAND

A Strike from the Rear

A five-point wind was raging over the sea. Heavy leaden clouds covered the sky. It was snowing. A squadron of heavy bombers under the command of Vasily Ivanovich Rakov was flying on a combat mission. The Soviet bombers were to destroy an important enemy target deep in the enemy rear.

The clouds kept the heavily loaded bombers close to the sea. Flying a strict formation, the squadron hedge-hopped for scores of kilometers, and then, when breaks appeared in the clouds, Rakov led the aircraft to an altitude of 400-500 m. But this was not without danger; the enemy's AA artillery was always on the alert. Maj. Rakov employed a stratagem. About thirty kilometers from the target,

Maj. Rakov suddenly turned aside. Having become accustomed to air raids from the direction of the front, the White Finns were deceived. The Soviet bombers came up from the rear. The enemy artillerymen gathered their wits only after the aircraft had appeared over the target and had dropped their bombs on hangars, warehouses, and other airfield installations.

Maj. Rakov's squadron made many combat sorties. And each of them was a shattering blow because of the commander's ability to feel out the enemy's weak point. The command rated highly this quality of Vasily Ivanovich Rakov in the struggle against the White Finns. He was awarded the title of Hero of the Soviet Union.

* * *

The Crew of Nikolay Stol'nikov's Plane

Pilot Nikolay Stol'nikov received his baptism of fire in the cold winter of 1939-1940. On 17 February 1940, Stol'nikov's bomber was attacked by enemy fighters when it neared the target. The blow was strong and violent. The left engine was put out of commission.

However, this did not frighten the determined pilot. He flew his plane on one engine and shot down one fighter. Stol'nikov had barely managed to drop his bombs successfully on the enemy's defensive fortifications when suddenly five more fighters attacked the bomber.

In the unequal battle, the crew fought manfully and bravely. The radio gunner

was wounded three times, but despite that he kept on firing accurately and shot down two more fighters.

But the ammunition ran out. The navigator was wounded. The other engine began to smoke.

Saving his crew, Stol'nikov skillfully glided down and landed the plane on the ice of a lake within enemy territory.

Taking everything they needed out of the plane, Stol'nikov and his navigator carried the radio man out and dug in to fight it out. Fortunately, the fight did not last long. Our fighters appeared overhead. They quickly found the place where the bomber had made its forced landing and managed to take Stol'nikov and his comrades out to friendly territory.

Nikolay Maksimovich Stol'nikov was awarded the title of Hero of the Soviet Union.



N. M. Stol'nikov

Intent on finding a break in the clouds convenient for bombing, the Whites, suspecting nothing, flew along on a left bearing. Gulyayev flew the "Nieuport" right up to the enemy and formed on him almost directly behind. Every strut of the hostile machines could be seen. Gulyayev gently pressed the machine-gun trigger. A long burst pierced the air.

The figure of the observer slumped down in the cockpit. The lead plane, turning sharply, dipped into a cloud and disappeared. Frozen in terror, the face of the observer in the second plane stared at Gulyayev. And at that very second, Gulyayev opened fire again. The "Havilland" passed through a thin wisp of cloud, the "Nieuport" right behind it. Recovering from the shock, the Wrangelite observer fired his machine gun. The yellow flashes of the shots could be seen. Something burned Gulyayev's arm.

Descending sharply, almost diving, the enemy plane headed for his own lines at top speed. The red-starred "Nieuport" pursued it. Gulyayev got everything possible out of his "Rhonde". But the Wrangelite was perceptibly lengthening the distance between them. The rear cockpit of the "Havilland" was emitting flashes — the terrified observer was still firing. Gulyayev gave him a few last shots and saw a bomb fall away from the White Guard plane. They were dumping it at random to lighten the plane for



Ya. Ya. Gulyayev. 1940 photo.

further flight.

Satisfied with the result of this air battle, Gulyayev approached Kakhovka at tree-top level. The Red Army men waved at him, their helmets perched on the bayonets of their rifles.

After it landed, several holes were found in the plane. The pilot's arm had only been creased by a bullet.

... We were sitting at the airfield. Some of the battle we had seen from the ground, the rest Gulyayev had just described. Of short stature, he seemed small when sitting, as he was now, hunched over, swinging his lap board between his legs.

"Well, I have just paid them back a little for the Commissar," he said, "but the main settlement is still to come at Perekop."

And still under the influence of the battle he had just gone through and the bitter news of Savin's death, Yakov Yakovlevich suddenly continued:

"Well, Comrade Lenin warned that it would be this way."

"How?" asked Vasil'chenko, surprised at the turn in the conversation.

"Like this," said Gulyayev, his large eyes flashing. "Once you start an offensive against the enemy, don't falter, keep on going, fight to the finish, never mind the difficulties."

"Yakov Yakovlevich, you talk as though you had seen Il'ich [Lenin] yourself," remarked one of the pilots. "Is that really true?"

"True," said Gulyayev quietly. "I had the great fortune to hear Comrade Lenin. The men crowded closer around Gulyayev. Had he, our Yasha, really seen Lenin?"

"Tell us about it, Yakov Yakovlevich," I begged.

Yasha cleared his throat and began:

"This happened, I remember well, before the July demonstration massacre in Petrograd. You know, I was a mechanic at the Gatchina Flying School. Well, a group of sailors came to the school. 'We are a delegation,' they said, 'from the Baltic. We are going to see Il'ich. But we haven't eaten a thing for two days. Feed us, brothers...'"

"I got excited: 'To see Il'ich?'"

"Yes, to see comrade Lenin," they said.

"Take one of us!"

"Okay, you can come yourself if the committee will send you."

"The committee did. We fed our buddies a triple portion of millet porridge with butter, and I went with them."

"We went to Piter [St. Petersburg] by train. Then straight to Kshesinskaya's Palace, to the Bolsheviks."

Gulyayev's voice was agitated. He had never talked so much. Everyone was silent; dozens of eyes were watching him attentively.

"At the Palace a guard stood at the door. The senior sailor showed him his credentials. We went in. We were directed immediately to a large room with green walls. Many people were there. An enormous chandelier hung overhead. Here a thought struck me: All these are sailors, I am the only one in a grey coat. What if Comrade Lenin asks suddenly: 'And by what authority are you here?'" But Sverdlov came up to us and chatted pleasantly with us. I calmed down a bit. But every once in a while I thought: What if he suddenly asks?"

"Unexpectedly a man walked in a side door. His forehead was high. His eyes were sharp. His movements were quick.

"Greetings, comrade revolutionary sailors!" he said. "I have been waiting for you for some time!"

"Greetings, comrade Lenin!" we replied.

"He immediately began talking to the senior sailor and to us.

"As soon as I saw him I was relieved. Such a man would not ask: 'By what right are you here?'"

"Then Vladimir Il'ich talked to us. I have forgotten much, but some of it stuck hard.

"Venomous are our enemies," said Il'ich. "It would be wrong to think that the conquest of power by the proletariat has been completed. Events are moving at a dizzy pace... We must fight to the end, in a revolutionary way, rousing the masses. The slogan 'All power to the Soviets' will triumph." (Yakov Yakovlevich spoke slowly, as though trying to remember the exact words).

"And when he was taking leave of us, Il'ich said: 'Once you start an offensive against the enemy, don't falter, keep on going, fight to the finish, never mind the difficulties.'"

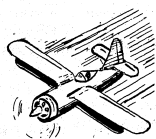
"And that's the way it was. Today the observer on the Wrangelite plane fought me with a machine gun at point-blank range. And I fought him. And I remembered Comrade Lenin's words. I am now telling you all this because we miss our Commissar," concluded Gulyayev.

Everyone could see how tired he was, and they all pondered over his tale.

... Like waves in a storm, the Wrangelite regiments rolled against the Kakhovka bridgehead. But it held. We were helped by the 51st Rifle Division headed by Comrade Blyukher [Blucher] that arrived from Siberia, hardened in battles with Kolchak.

By its daring air battles and its valuable reconnaissance flights, the Pravoberezhnaya Air Group won the esteem of the command and came to be known as the "eyes of the Army command."

On 20 August 1920 the offensive of the Red Army against Severnaya Tavriya began.



IN THE FIRST BATTLES WITH FASCISM

Maj. Gen. of the Air Force
M. N. YAKUSHIN

In 1936, Germany and Italy invaded Spain to support the Fascist revolt and to strangle the Spanish Democratic Republic headed by the Peoples Front government. It was clear to everyone that the struggle of the Spanish people against the rebels and the Italo-German interventionists was the fight of all progressive mankind against the threat of Fascism which was striving to enslave freedom-loving peoples.

The peoples of the entire world, seeing the serious danger, expressed their solidarity with the Spanish people, whose struggle for liberty and independence became the struggle of all progressive humanity against the black forces of reaction.

Thousands of people of various occupations and nationalities voluntarily went to Spain to join the ranks of those fighting against the onslaught of the Fascist hordes. There were organized several international brigades that carried the names of fighters for freedom and for the national independence of their countries: Chapayev, Tel'man, Lincoln, Garibaldi, Dombrovskiy. One of the brigades was named after the Paris Commune. In a single battle formation with the Spanish people stood Czechs, Italians, Germans, Russians, Poles, Yugoslavs, Austrians, Bulgarians. There were Communists, and Social Democrats, and people of no party.

After a whole series of requests and petitions, our group of young Soviet pilots found themselves among a group of volunteers going to Spain to join the Loyalist pilots and the volunteer fliers from other countries, and together with them to defend the Spanish cities and the peaceful people from the savage bombing by Fascist aviation.

Early in June 1937 we arrived in Barcelona from France in a passenger plane. The weather was hot. We went from the airfield to the city by car. At that time, the front line traversed the country from south to north, dividing Spain into two parts. The war could be felt at every step.

We drove along city streets that were practically empty. Encountered frequently were ruined houses, broken windows, overturned automobiles; here and there roadways were torn up. And then another building destroyed by a bomb. Hanging on one of the twisted metal beams was a child's crib. . . The people of Barcelona were silently rummaging through the debris in the hope of saving the people buried under it. Our driver, a Spaniard, told us that there had recently occurred in the city a Trotskyist-anarchist counterrevolutionary putsch, which had been suppressed by the people.

Our group consisted of fighter pilots. We had known before that our task consisted of protecting the population of the city from attacks by hostile aircraft; but now, when we saw with our own eyes how people who wanted to be free and happy were dying, it seemed that the word task sounded somehow unconvincing. Under these circumstances, the words duty or retribution were more appropriate.

And I realized that when I glanced at the faces of my friends. They expressed hatred of the enemy and determination, a desire to get to the airfield quickly so as to climb into a plane and go into combat.

On the second day we arrived at one of the airfields near the city of Murcia in the southeastern part of Spain. This was a rear-echelon airfield where pilots had gathered from many countries who had come either singly or in small groups. We were met by representatives of the Republican Air Force command. They immediately set about organizing squadrons. I found myself in a squadron that included several Russians, among them Serov, Yeremenko, Antonov, Rybkin, Shelyganov, Sobolev, Masterov. In addition to us, the Russians, there were assigned to the squadron three Spanish pilots, two Austrians, two Americans, and one Yugoslav. We made friends immediately, and our friendship was soon tested and strengthened in the first battles over Madrid.

Despite the "multilingual" composition of our squadron, we quickly found a common language. This common language gradually became Spanish, which we later began to speak not too badly (at least it seemed so to us). But at first, of course, we expressed ourselves mainly by gestures.


What little time we had was used for flight training. Everyone wanted to check himself to see whether he had enough experience, fortitude, endurance. Although for the time-being the battles were for practice and were fought between friends while the results were always "peaceful", nevertheless they were fought very bitterly. No one wanted to be defeated, and therefore we strove to analyze each "battle" to the minutest details, to learn all the strong and weak points of our machines. In a few days we would come to actual grips with a real enemy.

At the airfield we met several Soviet pilots who had joined the fight against the Fascist air forces before we did. In air battles over Madrid, Guadalajara, Huesca, they had acquired a wealth of combat experience. Meetings and conversations with them were a real schooling. In their importance, they were no less significant than our formal training.

For us novices, not experienced in actual combat matters, it was very important to learn that, for example, the persistence displayed by airmen in their first air battles builds confidence in their own powers and reacts favorably on their future combat activity. Our fighting comrades warned us that it would only take one display of faint-heartedness to encourage the enemy to greater impudence; and so it would be until he met real resistance. Therefore, said our friends, the Republican fighters were never the first to break off the engagement and never refused battle.

From these same conversations we learned some of the tactical methods of the German and Italian Fascist pilots and their habits. The more we listened to our fighting friends the more convinced we became that the most important thing in combat was not to lose the initiative.

Our stay at the rear-echelon airfield came to an end. What had it given us? That, only the future would show. At all events, we were ready to go into battle.



IN BATTLES FOR THE MOTHERLAND

Immortal Glory

This happened in the early days of the Great Patriotic War. A flight commanded by Capt. N. F. Gastello made a bomb strike against Fascist tanks on the Molodechno-Radoshkovich highway. The planes had started on their return course. At that moment a direct hit by an AA artillery shell set fire to the lead plane.

Gastello's attempts to put out the fire were unsuccessful. They could have used their parachutes, but the intrepid men preferred death to an enemy prison.

The bomber, guided by the firm hand of Communist Gastello went into a dive and plunged into the thick of Fascist tanks and tank trucks filled with gasoline. A tremendous fire burst out on the highway.

Immortal glory to the heroes! Captain Gastello was awarded the title of Hero of the Soviet Union. His faithful friends, Lt. A. A. Burdenyuk, Sgt. A. A. Kalinin, and Lt. G. N. Skorobogatyy, were posthumously decorated for their courage, bravery, and daring with the Order of the Patriotic War, First Class, by a decree of the Presidium of the Supreme Soviet of the USSR of 25 January 1958.

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The Heroism of a Radio-Gunner

It was 17 July 1941. For its twenty-sixth combat mission the crew of an Ar-2 aircraft, where Lt. Ivan Moiseyevich Brazhnikov was radio-gunner, was ordered to destroy a crossing on the Dnestr River south of Mogilev-Podol'skiy. The aircraft was escorted by three I-16 fighters. When still 20 kilometers from the target, the Soviet airmen were met by nine enemy planes.

Six of the hostile fighters entered into dogfights, while the rest attacked the Ar-2. Three against one.

After several attacks at an altitude of 800 meters, the bomber's left engine caught fire but it continued toward the target. Under continuous attack from all sides, the Soviet plane nevertheless reached the target and dropped its bombs. After the bombs were dropped, in turning away from the target, radio-gunner Brazhnikov shot down one of the enemy planes. At that moment, the Fascists set fire to the other engine.

In the continuing air battle, Ivan Brazhnikov shot down two more enemy planes with bursts of machine-gun fire, after which the crew abandoned the plane. The



I. M. Brazhnikov

radio-gunner landed on territory over which the combat had just taken place. With his back and his head burned, he was picked up by soldiers and sent to division headquarters. There he learned that the crossing had been destroyed. Brazhnikov was soon moved out of the division area and sent to the headquarters of the air army.

After his recovery, Ivan Moiseyevich Brazhnikov continued to assail the enemy in the air. In April 1942 by a decree of the Presidium of the Supreme Soviet of the USSR, radio-gunner Ivan Brazhnikov was awarded the title of Hero of the Soviet Union.

The squadron soon flew to a front-line airfield northeast of Madrid. I was the right wingman in Anatoliy Serov's flight. His exceptional flying ability, his inexhaustible energy, and his yearning to encounter the real enemies as soon as possible and "smash in their faces" — as he liked to say — set him noticeably apart from the other pilots. We did not yet know that our flight commander would prove to be an infinitely dauntless warrior, a hero, one of the renowned pilots of our country.

The mountains of the Central Cordillera appearing on the horizon suggested to us that Madrid should be somewhere nearby on the plains of the plateau of New Castile. Finally, on the left, we could see the city below. We had already spent some time in several Spanish cities, but somehow Madrid was especially exciting. In those days, the attention of the whole world was riveted to it. This was a fighting city, living through a great tragedy. Beginning in the second half of August 1936, the aerial bombardment of Madrid increased every day. The city became the principal objective of the German and Italian bombers. In a few months Madrid suffered great destruction and many casualties. In a single day in late October 1936, more than one thousand people were killed and wounded as a result of bombings.

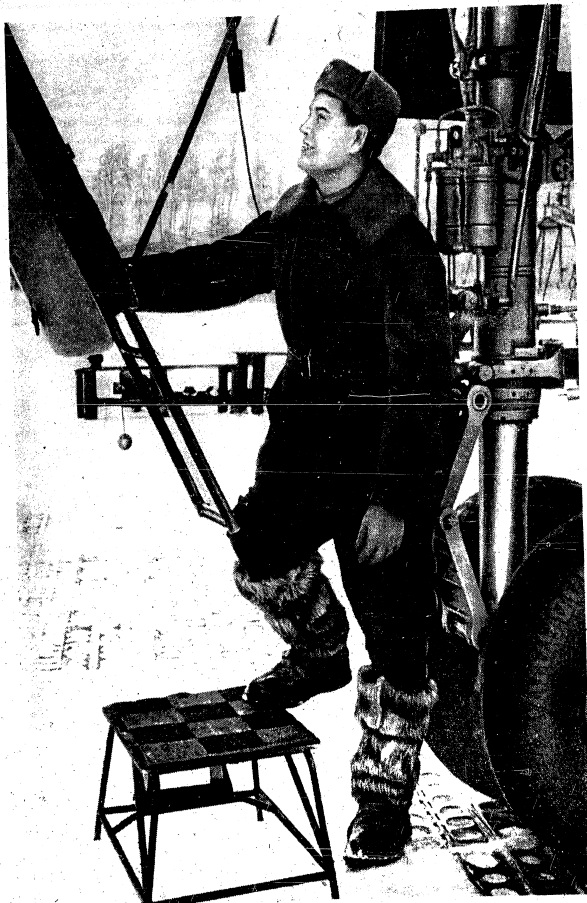
From left to right: A. K. Serov,
M. N. Yakushin, Ye. S. Antonov.

By conducting a savage bombing of the peaceful populace of Spanish cities, the rebel high command was counting primarily on affecting the morale of the Spanish people, on breaking their will to fight.

But the unpunished operations of the Fascist pirates soon came to an end. In October, the Loyalists received some then modern, high-speed fighter planes and bombers. Together with Loyalist pilots, the volunteer pilots fought in these planes. Among them were also those Soviet pilots to whom we were so grateful for their help during our training at the rear-echelon airfield.

The Loyalist Air Force immediately offered strong resistance to the enemy. The British newspaper "Manchester Guardian" said at that time: "The Government planes and pilots have already shown their superiority over the German planes and pilots. The air attacks on Madrid have practically ceased, because the German and Italian planes have been simply driven off."

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The navigator of a ship flown by an outstanding crew, Senior Lt. V. M. Tkachev, skillfully carries out his flight assignments in bombing. For his success in mastering new equipment, he has been awarded the Order of the Red Star.
In the photo: Senior Lt. V. M. Tkachev. Photo: A. I. Dotsenko.

In the First Battles with Fascism

41

We thought of all this as we neared Madrid. We soon let down for the approach and landed safely at an airfield that, to our surprise, proved to be a small hippodrome surrounded on three sides by the tall trees of a country estate. At the edge of this estate, parking areas had been built for the "chatos" (snub-noses), as the men of the Republican army had lovingly nicknamed our planes.

... At the break of dawn, we were already at the airfield beside our planes that had been made ready for flight. This had been taken care of by our new Spanish friends — technicians, mechanics, drivers. They were assisted by a few Russian volunteer mechanics.

With the first rays of the sun, several flights of the squadron took off. Each flight had been given its own assignment. Our flight headed by Anatoliy Serov was sent to make a reconnaissance of airfields in the area of the cities of Segovia and Avila, located beyond the ridge of the Sierra de Guadarrama. Having flown over the ridge, we found ourselves over enemy territory. Over hostile territory for the first time! It is hard to remember now what we felt most during this flight: doubt and lack of confidence in our abilities and our experience, or a calm faith in our strength, or a thirst for battle. But almost any flight means excitement, and that is a good feeling! In any case, it did not keep us from carrying out our mission. True, there did occur a trifling incident.

Approaching the last leg of the route, in the area of Avila we saw ahead and to the right some black silhouettes consisting of several symmetrical groups of three. Changing course, we were about to attack. But what is this? As we approached them, the silhouettes lost their outlines and dissolved. It turned out that they were anti-aircraft shell bursts. Turning around, we saw a whole cloud of bursts. The move to attack could be explained only by our inexperience. After landing, we and our friends had a hearty laugh over our first "battle".

The bursts that blanketed us on all sides nevertheless required caution. What could the anti-aircraft artillery be protecting? Evidently an airfield? That's what it was. Our assumption was confirmed.

It seemed that the situation in the air was getting hotter. Although the end of the day was approaching, it was necessary to make one more flight to reconnoiter an airfield that was far from the front lines. To send a flight was already risky. Then the commander decided to send the whole squadron (twelve planes). This decision, as we learned later, was right.

This flight was engraved in the memory of all of us as the squadron's first air battle, and in this battle its pilots all received their baptism of fire at once. Despite the fact that it was our first battle, it was fought in an exceptionally well-organized manner, decisively, and aggressively. In this sense, it was one of the best of the many battles that we fought in Spain. In spite of the fact that the first encounter with the enemy took place with an equal correlation of forces — twelve against twelve — the enemy was literally destroyed in the course of a few minutes.

It happened thus. The flight was coming to an end. We were returning to our own airfield with 30-40 kilometers yet to go. Suddenly, considerably above us and on a head-on collision course appeared a group of unidentified planes. No markings could be seen on them, the type of plane was also not clear; but by their silver-gray color it could almost unmistakably be seen that they were rebel planes. They passed over us toward the setting sun. It appeared that the enemy pilots did not see us,

since they did not reveal their intentions by any outward sign. However, knowing the enemy's habits, his desire to utilize the smallest advantage so as to attack, we became alerted. The enemy had two advantages: the first was his position above us, the second was the opportunity to attack out of the sun.

Each one of us was sure that the enemy would not let this favorable opportunity for an attack escape, and we prepared for him: the flight on the left moved over to the right side so as not to hinder the squadron's maneuver in making a left turn toward the enemy.

Our suspicions were confirmed. The enemy began to attack. It was even disadvantageous for us to enter battle because the reconnaissance flight was coming to an end and the fuel in the tanks was getting low; but at the command of the squadron leader Ivan Yeremenko, making an energetic turn, we met the enemy head on.



FOR THE MOTHERLAND

Master of the Sky



F. I. Shikunov

On 29 November 1943 six of our fighters flew out on a combat mission. The leader of the group was Guards Lt. F. I. Shikunov.

In the target area, Shikunov noticed a group of He-111 planes escorted by a pair of Fw-190's. Correctly evaluating the situation, he gave over the radio the command for the lower four some to cover the bombers, while he and his wingman suddenly attacked the hostile fighters. The latter immediately withdrew from the battle area.

The enemy bombers, left without cover, hurriedly dropped their bombs and fled.

At that moment, Fedor Shikunov noticed yet another group — about 30 hostile Ju-87 bombers. There was no time to lose, and he resolutely attacked the leader of the group and set it on fire with a single machine-gun burst. The enemy plane exploded in the air.

Attacks followed one after another. Still another Ju-87 plunged into the ground. Shikunov also drove off this group of enemy bombers, not permitting them to bomb our ground forces in battle formation.

Having barely repulsed the attack of a pair of "Messers", Fedor Shikunov saw yet another group of hostile bombers — the third. Its fate was the same as that of its predecessors: our daring fighters attacked the "Junkers" and broke up their

combat formations. Dropping their bombs outside the target area one by one, the enemy planes disappeared.

Two German fighters again hurried to the rescue, but it was too late. Fedor Shikunov, having done with the bombers, forced the "Messers" also to withdraw from the battle area.

After this heavy engagement with a numerically superior enemy, Fedor Shikunov justifiably came to be known as master of the sky. During the war years he flew 118 combat missions, participated in 40 air battles, and personally shot down 18 hostile planes. For his courage and daring, he was awarded the high title of Hero of the Soviet Union.

The fight began. All twenty-four planes engaged in the famous "tangle" that was characteristic of the air battles of that time. Now we could scrutinize each other face to face. Yes, they were silver gray "Fiats" with yellow-green camouflage and black crosses on wings and rudders. But in maneuverability they were inferior to our light and nimble machines, and without great difficulty we quickly gained advantageous positions for attacking. The well-coordinated beginning of the battle determined its further course.

From defense we went over to the attack. Our onslaughts became ever more persistent and bolder. Several flaming torches of hostile planes had already left their traces in the sky. The "Fiats", unable to withstand our attacks, tried ever more frequently to get away by turning, but they stalled in the turns and thereby exposed their "bellies" to the fire of our fighters. Gradually the air became clearer, and soon there were no "Fiats" at all. Only our planes still continued for a while, as though by inertia, to swirl around the scene of battle.

At the command of the leader, who had already taken a course for home territory, everyone settled into formation, breaking up into flights. What joy there was when we saw that each one was in place!

The first battle and with no losses — what a victory!

We approached the airfield in organized fashion and with a full complement, a rare occurrence after combat. On the ground, no one even suspected that the squadron had just gone through a battle. To our surprise, not only had we not suffered any losses, but we had not even received any damage that was at all serious. Next day, a report came into the squadron that six enemy planes had been shot down in this battle. And so, the squadron opened its combat account.

Despite the success achieved in the first battle, we could still not consider ourselves sufficiently experienced and acquainted with all the fine points of aerial combat. Frankly, we did not even fully understand just what had happened in the air, and scarcely a one of us was then in a position to examine and analyze the battle intelligently and in detail. The whole critique was reduced to a lively exchange of opinions among men who had for the first time encountered an enemy in a real fight to the death. Yes, there was still much we did not know then, but experiences are acquired gradually. Only one thing was clear: do not become conceited and remember that the enemy is strong, that he can be broken only by the staunch and the resolute, by men who have mastered their techniques well.

On the next day, at dawn began the operations of the troops on the Central front. With that day, there began intense combat activity for Republican aviation also. In

an especially difficult position were the fighter units, which comprised only a few squadrons for the entire front. They protected the troops from strikes by the more numerous air forces of the enemy, supported the operations of the Republican bombers, warded off the rebels' pirate raids on Madrid, and also made reconnaissance flights.

The July days were long and hot. The smoke of fires and the dust raised by shell and bomb bursts in the dry Castilian soil hung in the motionless, torrid air. They went as high as 3000 meters, covering the earth and the sky. From morning to evening, the air was filled with the drone of aircraft engines and the crackle of machine-gun bursts — the Republican fighters were waging intense and continuous battle with the Fascist air forces, covering the fighting operations of the army units and international brigades at the approaches to Madrid. The engines did not have time to cool. Some days it was necessary to fly six or eight combat missions, engaging in three or four air battles, usually against superior enemy forces. Despite the intense strain, the Republican pilots displayed remarkable steadfastness and endurance.

As was to have been expected, the combat friendship between pilots of all nationalities which started back on the rear-echelon airfield became strengthened in the battles.

A feeling of comradeship and mutual assistance in battle, hatred toward the common enemy, and a love for freedom — these are what determined success in combat. To this should be added such factors of very great importance as high flying skill, judicious initiative and resourcefulness in a complex combat situation, honesty, modesty, and, finally, the cheerful attitude of the whole group.

The temperamental and fearless Anatoliy Serov, the jovial and witty Zhenya Antonov, the good-natured and shy Yugoslav Petrovich, the calm and even-tempered Leonid Rybkin, quiet and modest Sobolev and Masterov, the gay Spaniards Rafael and Sardino, and others of our comrades aptly complemented each other and, despite differing characters and customs, made up a unified friendly group that later acquired the glory of the renowned Serov squadron.

During those difficult days, no less successfully fought the pilots of the squadrons led by B. A. Smirnov, I. A. Lakeyev, G. S. Pleshchenko, and others with whom we cooperated successfully. We soon learned of the famous exploits of these squadrons, and we were proud of their successes.

The intensity of the fighting increased. Continually receiving reinforcements from Germany and Italy, the Fascists increased their resistance. Suffering heavy losses in air combat, they began to operate in large groups. The Fascist high command introduced into combat for the first time a new type of fighter — the Me-109, hoping with its aid to take the initiative out of the hands of the Republican pilots.

The battles became fiercer, and news of losses in the Republican air forces became ever more frequent. Our squadron also suffered its first losses. Early in the morning, Serov, Karpov, Shelyganov, and the author of these lines flew out on call to an area west of Madrid to reinforce our fighters which were waging a battle against a superior enemy. As we approached the area of combat, our group was attacked from three sides by 22 "Fiats". An unequal battle took place. In it, Karpov was shot down. The wounded Shelyganov limped to our territory and landed

in a field where Spanish peasants gave him first aid. Serov and I were left alone. Fighting off the Fascist fighters pressing from all sides, we tried to draw them toward Madrid, to our own territory.

The situation became critical, but we were saved by anti-aircraft batteries that were following the battle. They opened fire, outlining the center of the battle with shell bursts, hoping thus to cut us off from the enemy. This proved to be enough to cause the "Fiats", which had just been attacking two fighters so "bravely", to scatter in all directions and quickly to retreat.

We were barely able to reach our own airfield, so serious was the damage to our machines. From the damage, for example, the wings of Serov's plane folded up on landing.

We had lost Karpov. But each loss cost the enemy dear.



FOR THE MOTHERLAND

The Skill and Courage of a Navigator



V. V. Sen'ko

The task of finding the target and leading other aircraft to it is entrusted to the lead plane.

This time, as usual, flying in the target-illuminating lead plane was the crew of Hero of the Soviet Union Dmitriy Baryshev, with Vasiliiy Sen'ko (now twice Hero of the Soviet Union) as ship's navigator.

The ship approached the target area, reducing altitude so that the target could be sighted visually. The entire crew stared into the darkness until their eyes ached. There was only just enough fuel — just enough for the thousand-kilometer return trip. Every minute seemed an eternity. And then, through the darkness, broke lines which seemed long familiar.

"Check point below", reported Sen'ko and gave the already computed course to the target. A few more minutes of flying, and in the darkness were outlined the contours of the military-industrial objective.

The plane went into its bomb run, so as to drop the flare bombs from the windward side.

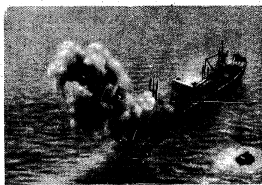
"Bomb run!", ordered the navigator, bending over the bombsight. Soon, literally like giant chandeliers, the SAB [illuminating aerial bombs] hung in the sky, slowly drifting toward the objective.

And only then, when the plane began turning for the next approach, did the rays of searchlights spring up in the sky. Immediately behind them flashed bursts of anti-aircraft shells, covering the entire area above the objective. Fragments began

to drum around the plane. The crew made the second approach, to drop the next series of flare bombs. The entire objective could be seen as plain as day. Toward the target, guided by the SAB's, other aircraft were already approaching. Soon, mighty blasts shook the air. Mission accomplished.

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Strike Against a Naval Target



Capt. V. N. Kiselev sank several enemy transports during the war. His squadron of naval torpedo planes sank Fascist convoys and made strikes against naval bases. Naval pilot V. N. Kiselev was awarded the title of Hero of the Soviet Union.

... In order to draw away some of the Republican forces around Madrid, the rebels undertook an advance in northern Spain in the area of Santander, where the Republicans were still holding on to a small patch of land. The Republican command was compelled to weaken the already scanty air forces in the Madrid sector and send part of the fighters to the north. There, in particular, flew the squadron commanded by Boris Aleksandrovich Smirnov.

The situation at the Central front became even more strained. The numerical superiority of the rebels in the air now became overwhelming. Nevertheless, the initiative remained in the hands of the Republican air forces. The rebels still would not risk battle with us unless they had at least a twofold advantage.

The bomber forces of the rebels, having suffered considerable losses in daytime battles, went over to night operations in the main. As a rule, single planes made the flights. Frequently during the entire night a bomber would fly over every 15-20 minutes and, making two or three approaches, would drop his bombs. Since the Republican fighters did not fly at night and there was practically no anti-aircraft cover, the enemy could make these flights with impunity.

What to do? We gave much thought to this.

Anatoliy Serov posed the question of night operations by the fighters against the insolent Fascist vultures. He began finding out who among the pilots had had night flying experience. There were a few such in our squadron. For them, night flights would have to be in addition to the daytime load, which was high enough already. However, this was not the principal difficulty. It was necessary to convince the pilots of the practicability of the "night venture", inasmuch as there was yet no experience in fighter combat operations at night. Naturally, many did not immediately believe in the possibility of the fighters' participating in night battles, the more so because at that time there were no searchlight fields and the airfields did not have even the most elementary equipment for night flying, not to mention any

facilities for control and vectoring.

Nevertheless, several pilots supported Serov's initiative.

Everything now rested on the consent of the command, which, considering that there was no system of night safety and control, doubted the feasibility of night fighter operations. But Serov was not one of those who stop half way. He believed more and more strongly in the practicability of the plan that had been devised. No one knows how it all would have ended if F. A. Agal'tsov, who at that time was the Commissar for the group of Soviet volunteer pilots, had not interfered. He strongly supported Serov's initiative, after which the group commander was compelled to consent to the organization of night flying for the fighters.

From among those who wanted to try, four men — Serov, Rybkin, Antonov, and I — were selected at first. We amicably undertook the preparation and organization of night duty. We were given the best planes and were assigned the best mechanics. A projector was also found to illuminate the landing strip; a telephone line was strung from the command post to the aircraft parking strip. And that, if you please, was the entire simple organization of night combat operations, requiring only a few hours to set up. The warning was the appearance of the bombers themselves above the airfield, and sometimes the falling bombs. We kept watch at the Alcala airfield, where we landed each evening after the completion of daytime flying.

The enemy, suspecting nothing, continued to bomb our airfields regularly. Several times we soared into the quiet night sky in the hope of encountering at least one bomber, but all in vain. How to spot a hostile plane? There were no lights on it, it was not lighted up by searchlight, while the rising half moon cast such a pale light that the sky seemed to be even darker and more impenetrable. And the bombs continued to fall. What an annoyance! The enemy was some where nearby but we could not see him, despite the fact that we were in the air. Once Rybkin noticed some "blinker men", marking out the airfield on three sides. He immediately opened fire, and the representatives of the fifth column ceased their activity!

We had already begun to doubt the usefulness of our venture, while some of our comrades in the squadron advised us to give it up. But Serov would not even listen to such advice. On the fifth or sixth night, flying at an altitude of 3000 meters, I suddenly saw on the ground, almost directly beneath me, a series of exploding bombs. Carefully scanning the heavens, I spotted at about 100 meters above me the black silhouette of a heavy bomber. Without thinking much, or more accurately without thinking at all, I plunged to the attack from below and behind, not even observing the required distance. The attack was made from directly below and almost vertically. It was necessary to open fire immediately with all four machine guns because the distance was rapidly growing shorter. I saw the cone of tracer bullets pierce the three-engine Ju-52, but the plane did not catch fire and, without changing direction, continued flying. To avoid collision, I pulled out of the attack and again repeated it, not letting the plane out of my sight. The second attack was just the same. This time I continued firing until my speed was gone entirely, until my plane fell into a spin. But when I pulled the machine out of the spin, I found that the bomber had already disappeared. After landing, I reported my failure. We analyzed the reason in detail: haste and lack of consideration for the enemy bomber's weak points.

My failure grieved us all, but at the same time it lifted our hopes. It had been proved that an enemy plane could be encountered and attacked at night, and therefore

it could also be shot down.

But what happened? Why did the rebel bombers cease their attacks, while for three nights we sat in our planes waiting in vain for our nightly "guests"? Apparently, they sensed that all was not well and had learned that even at night it was no longer safe to fly over Republican territory.

On the night of 26 July 1937, Anatoliy Serov and I, tired and disgruntled, arrived at the airfield to stand by our planes. We had fought several air battles that day. Although the Republican fighters continued to wage a successful fight against the Fascist aviation, this struggle was becoming harder each day: the enemy was continually sending new forces into the fray. The pilots were becoming exhausted from the extremely heavy load.

On the ground the enemy was also concentrating strong forces, and therefore the Republican armies were advancing very slowly.

At about 12 o'clock at night, we had a telephoned report that the rebel air forces were bombing Republican troops in the area of the Escorial. Serov and I took off and headed toward the front. This was the first time we had flown toward the front lines at night. We determined the area to be patrolled by the centers of conflagration. Serov began patrolling at an altitude of 2000 meters, while I climbed to 3000. In about ten minutes I saw an enemy bomber flying toward me. This time he would not get away! Letting him go by, I made a 180° turn and began closing in on him from the rear right at practically the same altitude. Knowing that the junction of the right wing and the fuselage was a vulnerable spot (the gasoline tank for priming the engine was located there), I formed on the bomber, almost touching him, equalized my speed, aimed, and opened fire. Flames spurted immediately from the right side of the fuselage. Almost simultaneously the enemy gunner opened fire on my fighter, but it was already too late — the burning plane was beginning to drop. I followed it until it hit the ground.⁽¹⁾

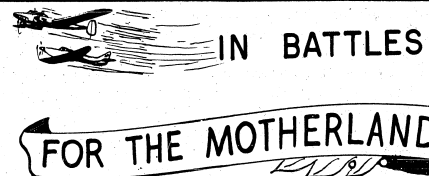
We had to continue patrolling. But how I wanted to hurry back to the airfield to share my joy! I had barely climbed out of my plane when I fell into the powerful embrace of Tolya Serov, who was no less joyful than I — perhaps more so. After all, it was a victory for his idea. Soon afterwards the commanding officer of our group also congratulated me by telephone on being the "first in the world".

The following night, in the same area and under the same conditions, a second Fascist bomber was shot down. This Anatoliy Serov did, thereby proving conclusively that fighters at night were a formidable weapon against bomber aircraft. After that, the Fascist air forces ceased their night operations on the Central front. Later on, the Republican fighters successfully operated at night against the Fascist bombers, wherever they might appear. Yeremenko over Saragossa, Stepanov and Finn over Barcelona, Spanish pilots over Valencia — all repeated and confirmed Serov's "night venture".

A few days later our squadron was to fly from the Central front to the Mediterranean coast, to the area of Valencia, for a rest. The night before we left, we were awakened ahead of time and informed that the squadron was to leave immediately, not

(1) This episode has also been described previously in literature. The pilot who shot down the enemy plane in night combat was called Carlos Castejon. Carlos Castejon was the name given to Soviet volunteer pilot Mikhail Nesterovich Yakushin. — Editor

for a rest but to go somewhere else. To our question "Where?", they told us that it was not yet definitely known but somewhere north. We all thought of the small patch of Republican land far to the north in the area of Santander, where a Spanish squadron under the command of Boris Smirnov was fighting courageously. We glanced at the map — it was a good 400 kilometers of flying over territory occupied by the enemy.



The Hundredth Sortie

This happened in January 1942, when the German Fascist troops on the Masel'skaya line in Karelia were striving to break through to the main railroad line from Leningrad to Murmansk. It was bitterly cold. On a sunny morning, element commander Vasilii Knizhnik was preparing for his hundredth combat sortie. He was to lead into battle some young pilots who at that time had not flown even once over the front line.

In the area of the target, the leader's experienced eye immediately discerned where the camouflaged dugouts and bomb shelters of the enemy were.

Knizhnik gave the signal for the attack and put his machine into a dive. Bombs rained down on the fortifications. The deafening bomb blasts and the crackle of machine-gun fire did not cease until the target was destroyed.

The mission had been carried out excellently, and the planes headed for their home airfield. But suddenly, from out of the sun and to the rear appeared four Me-109's, while above them were six more enemy fighters.

An unequal battle began. In a few minutes two Fascist planes V. Knizhnik fell to the ground. The enemy obviously had the advantage in strength. The situation was made more difficult in that the supply of ammunition and fuel of our fighters was getting low. Despite this, Vasilii Knizhnik continued the fight to the last round. The last burst had been fired at the enemy. Knizhnik saw two enemy planes "putting the squeeze" on Sergeant Rulev's machine. Without hesitating, Vasilii decided to ram. He approached the hostile aircraft, banked, and hit the enemy plane with his left wing. The enemy dropped like a rock and plunged to the ground.

* * *



Two Ramblings in One Battle

On 8 April 1942, six Soviet fighter pilots encountered 28 Fascist planes heading for Murmansk.

The Soviet pilots engaged in battle. Exceptional bravery was displayed by Aleksey Stepanovich Khlobystov, who was later awarded the title of Hero of the Soviet Union. He boldly led his group to the attack. One hostile fighter caught fire and began slowly descending to the ground.

For a brief moment the enemy was stunned; the Soviet fighters took advantage of this. They broke through to the bombers — and in a trice one of them was shot down. The others began ridding themselves quickly of their bombs.

The ammunition was gone. Khlobystov decided to use ramming tactics. He came up on the tail of an enemy plane. The enemy tried to get away by descending, but Khlobystov would not let him do that. Out of ammunition, he increased his speed, overtook the enemy, and rammed him with his right wingtip. The Fascist crashed to the ground.

Then Khlobystov took his place in formation, continuing to lead the fighters. And again, maneuvering, he came up on the tail of an enemy plane. Closing in on him, he hit the empennage with the same wing. One more enemy plane was disposed of.

We soon received our assignment. It appeared that we were to fly to Catalonia, to the area of Barcelona. We were to cover the unloading at sea of a large ocean liner that had brought arms from Marseilles for Republican Spain.

Then in late August, along with other Spanish squadrons, we flew to one of the airfields east of Saragossa. There began a land operation, and with it bitter air battles broke out again — this time principally with the German Fascist air forces reinforced by a large number of Me-109 fighters. But even here the Republican air forces did not yield the initiative. Just as at Madrid, the rebel bomber forces suffered considerable losses in day battles and were compelled to resort to night operations. But now we knew how to act in such cases, and Yeremenko soon proved this, shooting down an enemy bomber at night.

The Republican fighters gave the Fascist air forces no peace. The rebel command was preparing to strike a blow at the Republican airfields to snatch the initiative from the Republicans. To this end, a large number of aircraft were concentrated at the Garapiniles Airfield. But this plan was not fated to be carried out. Several Republican squadrons struck a crushing deterrent blow, destroying a large number of enemy planes.

... The time came to part with our Spanish friends. It was early autumn. Continuous rains had brought quiet to the front. We handed our machines over to young pilots, and ourselves returned to our Motherland.

Leaving the land of Republican Spain, we carried in our hearts an ardent love for its freedom-loving people, for our combat friends in the international units, and a burning hatred toward the most evil enemy of mankind — Fascism.

NEW TACTICAL PROCEDURES BORN IN BATTLE

Maj. Gen. of the Air Force A. I. POKRYSHKIN,
Thrice Hero of the Soviet Union

In the years of the Great Patriotic War, Soviet pilots made extensive use of the "falcon thrust". Human ingenuity adopted and modified this bird's method and made of it one of the more effective ways of attacking hostile aircraft. In the heat of battle, the Soviet pilots tested and perfected this technique, discovering new variants to suit each air situation. Life itself suggested the paths to discovery.

A sunny spring morning in the Kuban' region comes to mind. We were flying in the direction of the front line where we were to give air cover to our troops. On the left stretched mountains of the Caucasian range, their silvery summits glistening, and below us on the right lay the boundless stretches of the fertile Kuban' steppes as far as the eye could reach. Spring was in full bloom, yet no tractors nor seed plows were visible in the fields. The rich black soil was being plowed up by bomb and artillery shell bursts.

O Kuban', beloved Soviet soil, how the Fascist barbarians have disfigured thee! Fury, noble fury, raged in my breast. With even more pains the pilots sought out the enemy to destroy him and to sweep the sky of their Motherland clean of carrion birds.

We fly at high speed in order to gain an advantage over the enemy. Then we fly patrol, not on a horizontal plane, but in descending flight, maintaining, however, the prescribed altitude while having the necessary speed reserve.

Suddenly down below we see that three of our fighters are trying to shake about ten Fascist planes. In defense they go into a wide turn. No time to lose. Instantly I reach a decision — attack!

Suddenly we tumble down from above in a steep dive into the swarm of "Messers". The "falcon thrust" was just the thing. The outline of the enemy plane was growing larger and larger in the sight. Automatically my hand tends to press the firing button. But reason prompts me: too early. I must hit him for sure at close range. The enemy pilot tries a sudden breakaway, but it is too late. A stream of fire riddles his aircraft and, belching a bluish flame, it heels over on its wing.

I want to snap my plane out of the dive; I cannot lose altitude, since there is the possibility of colliding with fragments of the enemy plane. I black out and for a split-second I lose consciousness.

"What a beautiful attack!" I hear Dzusov's voice from the ground and I go in for a landing.

Back on the ground we analyze the attack.

"The plane should be pulled out of the attack sooner", said one of the pilots.

"The dive angle should be shallower", advises another.

We pick to pieces, we analyze. Neither the one nor the other suggestion is apt. If we were to follow these suggestions, then the main advantage of the falcon thrust—impetuosity and suddenness—is lost. After some searching and testing, a new tactical procedure takes distinct shape. The fighter dives just as steeply but not directly at the enemy aircraft, allowing him to slip ahead a little. Then the plane "breaks" and attacks at high speed and from the rear, but at a shallower angle. This method of attack has more than once paid off for our pilots. The advantage of the falcon thrust is preserved in it. In this connection, the fighter not only maintains its altitude, but climbs as well after the attack as a result of the high speed. And herein is the guarantee of success in subsequent attacks.

A lofty feeling of patriotism inspired the Soviet pilots to achieve heroic feats in the name of the Motherland. At the same time we knew that victory in combat requires a high degree of skill and a continual improvement of tactical procedures and methods of operation.

It is known that aviation equipment and armament were improved and altered during the war, which fact was bound to influence the tactical procedures of aerial combat. This is why Soviet pilots used to analyze in great detail their aerial combat operations, seeking the most effective procedures.

Our Air Force commanders have made the experience of their subordinates in combat operations generally known. However, those men who buttressed this knowledge with their personal combat experience were the ones who most successfully coped with the problem. Such commanders supported in every way the searching efforts of the pilots who were working out new methods of operation, because the commanders themselves became convinced in combat of the expediency of these new methods.

Many new tactical procedures and methods of operation originated in combat. But a great deal of thought was necessary on the ground in order that, on a basis of profound theoretical generalizations and further practical testing, these procedures and methods be perfected, developed, and widely adopted in practice.

It was 1942. In MiG-3's we were escorting Il-2 ground-attack aircraft. Off in the distance two groups of Fascist German fighters appeared. One of them tied up our striking group in combat, while the other tried to break through to the "Ilyushins". A pair of enemy planes made an approach from the left rear. The Soviet pilot who was giving direct cover to the ground-attack planes suddenly turned left so as to repulse the enemy attack, but went into a spin. The attack was repulsed by another pilot who came up just in time from the striking group.

"No, this will not do," I thought, "we have to find some other escort procedure". Maintaining his position in formation, the fighter had to fly at the lowest possible speed. This fact naturally limited his freedom to maneuver. This meant that we had to develop a procedure whereby fighters would not lose their foremost capability—speed. It was necessary to find an escort method by which the fighters could not only repulse attacks against the escorted aircraft, but could safeguard themselves as well from the enemy attack. During the short breaks between engagements the pilots held lively discussions of the different versions. Some versions were rejected

as soon as they were proposed, while others were tested aloft. At last a new procedure was found. We named it the "scissors".

The fighters were divided into two groups and they flew around the ground-attack planes on a spiral, as it were. The first group at the start flies, say, on the left side, and the second on the right side. After this their flight paths cross and they switch positions, changing from one flank to the other. In this way the fighters could fly at maximum speeds, commanding greater opportunities for giving cover to the escorted planes. At the same time the planes could repulse each other's enemy attacks, while protecting each other from the rear.

Once a group of us comrades were standing around on the airfield. One after another some fighters flew overhead saluting us with a rich display of aerobatics. They were pilots of a neighboring regiment who were expressing their delight at receiving their new high-speed aircraft. Suddenly one of the pilots, trying to execute a "barrel", lost altitude while performing the maneuver. "That's no 'barrel', that's a 'tub'," remarked one of the pilots standing nearby.

"Probably some youngster," I answered. Then to myself I thought: That was an interesting figure. I wonder if it isn't possible to use it in combat to slip below the stream of fire of the attacking fighter.

All day long we pondered the problem of how to set up this tactical procedure. We sketched diagrams and made rough estimates. It seemed to work out fine on paper. The next day I went up. I tried to execute an incorrect controlled "barrel" with a loss of altitude. It clicked. According to plan, it should work out as follows: if the enemy approaches the rear of my plane, I withdraw from his attack down below the stream of fire by using the "barrel".

I decided to consult with my friends. I showed my diagram to pilot Iskrin and others. After hearing me out, Iskrin said:



Capt. A. A. Ternovskiy, commander of an outstanding crew, sets an example of mastering complex aircraft equipment and of skillful training and instruction. For the successful accomplishment of missions he has received more than 20 commendations. Communist Ternovskiy is the Party Bureau secretary of a squadron. In the photo: Capt. A. A. Ternovskiy is working with training apparatus. Photo: A. I. Dotsenko.

"An enticing idea!"

Another pilot had a different opinion.

"Nonsense. A childish figure," he sneered.

But I had faith in the maneuver; other pilots also believed in it.

Together with Iskrin I went up, and we engaged in aerial "combat" over the field. Iskrin attacked my plane from the rear. As soon as he got within range of effective fire, I made a "barrel" and slipped away from under his attack. We repeated a number of attacks in this way, always changing places. We determined the moment of initiating the maneuver, its timing, etc.

Soon we had the opportunity to test this procedure in combat. In a group aerial battle with superior enemy forces, three hostile aircraft fell upon me. I attacked the leader, but at that moment I heard my wingman's anxious voice:

"The enemy is behind!"



Ground-Attack Planes over the Target

On 7 Jan 1944 seven Il-2's soared into the air. I. M. Dolgov was the leader of the group. The pilots were assigned the mission of delivering a strike against the Shepetovka railroad junction. In order to destroy such a target, unusual precision of fire and bombing was required.

In the morning, after returning from a reconnaissance mission over this area, Dolgov planned the flight route and the target run heading. The commander agreed with his suggestion.

And now the planes flew over the woods 10 - 15 km north of Shepetovka, emerged from the enemy rear west of Shepetovka, and turned onto the target. At first the Fascists mistook the Soviet pilots for their own. But when they realized their error and opened AA fire, it was too late. Our pilots attacked from an altitude of 400-450 m, opened machine-gun and cannon fire, and dropped their bombs.

After the liberation of Shepetovka in February 1944, a special commission investigating the results of operations by the Dolgov group established that during the raid 14 enemy railroad trains were destroyed (up to 460 coaches and flatcars and seven locomotives), while five adjoining lines were destroyed, as well as a railroad car repair depot, a water tower, and other installations.

This strike was exceptional in its effectiveness. It was possible only because of the courage, daring, and the high degree of skill on the part of the ground-attack pilots who carried out the commander's order despite all the difficulties.

Without looking around I instinctively went into a "barrel" with a loss of altitude. And at that very moment I saw a stream of fire flash overhead, and right behind it shot by the enemy fighter. A feeling of joy seized me. The maneuver was a success. However, this was a defensive procedure. How could we make it into a method of attack? It is a fact that every aerial combat maneuver must necessarily be used both for defense and for offense.

Once again we began to make calculations, to analyze graphs and diagrams. Then we ran still another series of practice aerial fights. With each flight the new tactical procedure was further polished; it became more streamlined, terminating each time in a more precise attack. The final diagram of the maneuver appeared in my album. Whenever the enemy attacked suddenly from the rear, the fighter withdrew from the fire in a controlled "barrel" with simultaneous reduction of speed; and thus, finding himself immediately behind the hostile plane's tail, the pilot opened fire on the enemy. This procedure was recommended to other pilots as well.

Searching daily for new aerial combat procedures paid off. In our unit the pilots' operations were characterized by versatility; every time we countered the enemy with new procedures. The number of kills kept growing.

Due to their courage, initiative, and resourcefulness, our pilots often in the course of battle discovered new modes of operation and applied them right on the spot.

One aerial fight in which G. A. Rechkalov and A. I. Trud joined forces with me comes to mind. Each one of us led a foursome. Our twelve planes took up a "shelved" combat formation. We encountered about 40 enemy bombers and fighters. Rechkalov and Trud rushed in to attack the escort fighters and tied them up in combat. My foursome had to attack the bombers. But, having spotted our planes, they formed a circle and opened intensive defensive fire. It was difficult to approach the enemy planes from the outside. Of course our pilots, without thinking twice, could have attacked the circle and knocked out the enemy. But why should I risk my comrades' lives when it was possible to find a more effective tactical procedure?

Sizing up the situation, I decided to penetrate the circle with a vigorous maneuver and to attack the Fascist planes from within. In the descending maneuver, my wingman Golubev and I were the first to penetrate the enemy formation; we were followed by Zherdev and his wingman. This maneuver startled the German pilots. They could not open fire within the circle for fear of hitting each other. We, on the other hand, fired at them at short range, although we were limited in our maneuvering. One bomber was destroyed by the very first bursts. But in the meantime I was attacked from the above rear by a fighter which had approached from a higher level. There were shell-bursts near my right wing. I threw the plane to one side. The enemy never had a chance to fire the next burst. He was hit by my combat mate Zherdev. Combat friendship and mutual support — qualities inherent in our pilots — saved the situation.

The battle continued. Making wide turns within the circle of hostile planes, our pilots attacked them intensively. A few more Fascists found their graves on Soviet soil. Soon the enemy bombers, having dropped their bombs pell-mell, began withdrawing in great haste toward their own territory. The impending strike against our advancing troops was brought to naught.

Towards evening a wire came from the ground troops command thanking the pi-

lots for successfully accomplishing the air cover mission.

In the course of battles one of those forceful vertical maneuvers was developed which later was widely adopted and practiced by our pilots during the war. This maneuver enabled pilots to effectively employ the superior capabilities of Soviet aircraft.

Once in an aerial fight my wingman, carried away by his attack, broke away and had to formate onto a group of our fighters. At the time I was attacking a pair of enemy fighters. Having spotted me, they withdrew by making a combat turn into the sun. All my efforts to catch up with them were in vain; I found myself about 300 m below them since I did not have sufficient speed. As it turned out, these were the enemy's newest aircraft, the Me-109F.

My fuel was low and I tried to withdraw from combat; but the enemy fighters immediately attacked. I had to turn to face them. But again they eluded me. And this was repeated several times.

"I've got to do something", I thought, and began to break away in a descent. When the enemy fighters overtook my plane and were already coming within range for effective fire, I abruptly turned the plane on its back and put it into an almost vertical dive. The Fascists fell behind a little, but then began closing in on me again. Jerking at the stick, I pulled the plane out of the dive and pulled up into a zoom. I grayed out from excessive G-force but continued my planned maneuver and threw the plane into a vertical spiral; at the end of this I laid the plane over on its wing and at that moment I caught sight of an enemy plane below and in front of me. I made a slight corrective turn and caught him in my sights. A long burst — and the Fascist carrion bird, belching smoke, went into a spin. The second enemy plane disappeared in the west.

On the way back to the field I tried to think through my maneuver. I wanted to analyze it and find out why I succeeded in gaining a victory over the Fascist pilots who were flying their newest planes. The conclusion was obvious: we must make more extensive use of the vertical maneuver. By the way, it must be mentioned that other pilots were arriving at the same conclusion. The vertical maneuvers were being perfected in the course of the war, were being enriched by collective experience.

We found it necessary to gather literally bit by bit all that was valid in combat experience. As it is known, every pilot used to observe only a certain limited portion of the air space. In order to have a complete picture of a battle and to reach correct conclusions, we made a practice of carefully questioning all the pilots of a group with a subsequent detailed critique of their operations. All this allowed us to reconstruct an overall battle picture and to work out the most expedient methods of operations for our fighters.

With a view to making combat experience widely known in our group and units, during the war years we often made use of tactical conferences in which experienced pilots actively participated. Typical aerial combats were analyzed at the conferences, new procedures and operational methods were worked out and were given theoretical substantiation.

One such conference, for example, was conducted on a front-line scale under the direction of Ye. Ya. Savitskiy, now a Colonel-General of the Air Force and twice Hero of the Soviet Union. Many famed pilots participated in the work of the con-

ference; twice Heroes of the Soviet Union V. D. Lavrinenkov, the Glinka brothers, A. V. Alelyukhin; Heroes of the Soviet Union, Armet Khan, G. Golubev, and others. The foremost experience was made widely known and propagandized also through the press; this enabled us to bring it to the attention of a wide mass of flying personnel. All this helped to conquer the enemy.

Experience in perfecting tactics in the course of combat operations has not lost its significance even at the present time. While the flying personnel is mastering present-day aircraft, new methods of employing them in combat are developed. To make this experience widely known day by day, to seek out thoughtfully what is new and progressive — that is the noble task of Soviet pilots and Air Force commanders.



Over the Oder

The day of complete defeat for Hitlerite Germany was fast approaching. Our troops were pounding the enemy regiments in the Oder region, but the enemy continued to resist desperately.

Attempting to save the situation, the Hitlerites employed a jet fighter. However, this novelty was dealt with. In his very first encounter with an enemy jet plane the Soviet fighter pilot, I. N. Kozhedub was victorious.

On 24 February 1945 Kozhedub, with his wingman Titorenko flying La-5's took off on a combat mission. They flew over the Oder. Suddenly Kozhedub saw a plane dart out of the haze at an altitude of 3500 m. Its speed was maximum for the "Lavochkins", and Kozhedub immediately realized that an enemy jet fighter was in the air.

The pilot instantly evaluated the situation and reached a correct decision. He squeezed the maximum thrust out of his plane's engine, executed a skillful maneuver, and took up an advantageous position for attack.

Titorenko was the first to open fire on the jet plane; however the stream of his burst missed. The Fascist pilot noticed the stream of fire and began to withdraw with a left turn. In so doing he exposed his machine to the cannon fire of Kozhedub's plane. Without delay came a well-aimed burst, and the enemy jet fighter began to disintegrate in the air.

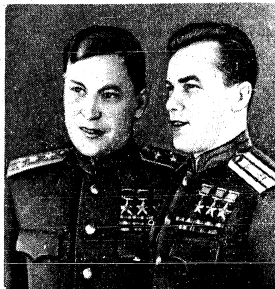
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Thrice Heroes of the Soviet Union

In the years of the Great Patriotic War, love for the Motherland and hatred of her enemies gave rise to mass heroism. In this period over 2000 pilots, navigators, and aerial gunners were awarded the title of Hero of the Soviet Union. Sixty-nine pilots were awarded the title of Twice Hero of the Soviet Union. Pilots Aleksandr Ivanovich Pokryshkin and Ivan Nikitovich Kozhedub bear on their chests three Gold Stars each.

A. I. Pokryshkin (left in photo) personally downed 59 enemy planes, made 550 combat sorties, and participated in 137 aerial combats.

I. N. Kozhedub has 62 downed enemy planes to his credit. Kozhedub made more than 300 sorties and took part in 120 aerial combats.



IN THE KUBAN' SKY

Guards Col. G. A. PSHENYANIK
Docent, Candidate of Military Sciences

In the spring of 1943 fierce aerial combats flared up over the Kuban'. They lasted about three months and ended in a smashing defeat of the German Fascist Air Force.

Combat operations in the Kuban' developed at the time when Soviet troops advanced far to the West after having liquidated a Hitlerite troop concentration encircled near Stalingrad. The advancing Soviet Army troops cut off the enemy troop concentration which was operating on the southernmost flank of the Soviet-German front. To this troop concentration, sheltered behind a net of defensive installations which the Fascists called the "blue line", a mission was assigned: to hold the Taman' peninsula, and afterwards to use it as base of operations in developing new operations in the Northern Caucasus.

British-American imperialists criminally continued to drag out the opening of a second front in Europe. The Soviet Army alone bore the entire burden of the war against the Hitlerite coalition. Counting on this, the Hitlerites were planning a new general offensive. The enemy force, which was on the defensive in the Taman' peninsula had — according to the Fascist plans — to draw upon itself large Soviet Army forces and in this way make it possible for their troops to advance in other front sectors, in particular in the Orel-Kursk sector.

Aviation was assigned an important role in carrying out these plans. Its mission was to inflict a heavy defeat on our Air Force, to support the combat operations of German Fascist troops on the Taman' peninsula, and to create favorable conditions for their own aviation on the Kursk line of advance.

By April the enemy had increased his Air Force concentration to 800 planes. Crack fighter squadrons were part of this concentration. During the same month 16,660 German Air Force sorties had been noted — i. e. 3.5 times more than in March.

There were two primary missions facing the Air Force of the North Caucasus front at the end of April 1943: first, they had to acquire air supremacy and in this way protect ground troops from enemy air attacks; second, with the main forces of bomber and ground-attack aviation, they had to support the advance of ground troops in the region of Myskhako (South of Novorossiysk).

In the middle of April, according to the instructions of the Supreme Command, three fighter aviation corps were moved to the Kuban'. An approximately equal cor-

relation of forces — with slight odds in our favor (1.2 : 1) — determined the most strenuous period of aerial combats.

The morale of the Soviet pilots who were defending their Motherland was exceptionally high. Owing to their selfless toil on the home front, our people supplied the front line with the necessary amount of first-class aviation equipment and armament.

Preliminary work concerned with raising the pilots' combat skill, conducted in Air Force units and groups, played an important role in the successful operations of Soviet aviation in the Kuban'.

All the pilots had studied the aerial tactics of the enemy, who was operating in echeloned combat formations and striving to disperse our fighter forces, using the element of surprise in his attacks. Shortcomings in aerial combats were thoroughly analyzed.

The most effective tactical procedures of our fighters were being generalized and practiced on a large scale: the organization of formations echeloned in altitude, improvement of coordinated action in the pair, maximum utilization in combat of the vertical maneuver and of advantage in altitude.

Fighter aviation bases, with consideration of the terrain, were brought closer to the front line (on the average, airfields were being located at a distance of 30-45 km from the front line, while one airfield was located at 10 km).

Party and Komsomol organizations developed on a broad scale the work of inculcating staunchness and courage in combat, striving for a leading role of Communists and Komsomol members. Communist briefings were an important part of Party-political work. At the end of a combat day, Party organizations assembled Communist pilots for 15-20 minutes and summed up the events of the day. Every day political orientation talks on the topic "Heroes of today's combats" were conducted in the regiments. On the airfields every day — and sometimes twice a day — combat leaflets were printed which popularized the exploits of pilots. All this mobilized and inspired our soldiers to carry out their missions in an exemplary manner.

Combat operations on the North Caucasus front in the spring of 1943 can be divided into three phases: from 17 to 24 April — defensive combats of the troops of the airborne group during the enemy advance in the region of Myskhako; from 29 April to 10 May — the advance of the 56th Army in the region of the stanitsa [Cossack village] of Krymskaya; from 26 May to 7 June — penetration of ground troops into the enemy defense line ("blue line") in the Kiyevskoye and Moldavanskoye regions.

During the first phase the enemy tried to liquidate our group of airborne troops at the base of operations in the Myskhako region. From the very beginning of the offensive, the main forces of his aviation, which surpassed ours one and a half times (on the given sector of the front), were thrown against the airborne troops.

Under difficult conditions, Soviet aviation successfully carried out missions supporting the combat operations of the airborne troops who were carrying on stubborn defensive operations southwest of Novorossiysk. Our fighters caused great losses to the enemy Air Force and decreased the effectiveness of its attacks. The situation was the more complicated as the airborne groups were isolated. At the cost of great losses, the German Fascist troops succeeded in breaking through the main line of resistance of our troops and in driving a wedge to a small depth in one of the sectors. The threat of a further widening of the enemy breakthrough was arising

and of splitting our airborne group into two parts.

Till 17 April the main strength of the North Caucasus front Air Force was aimed at supporting the troops who were advancing in the direction of the Cossack village of Krymskaya. The airborne group was supported only by aircraft of the Black Sea Fleet and by a part of the forces of the Fifth Air Army; at the same time they had to operate mainly during the night because of strong countermeasures by enemy aviation.

It is natural that under such conditions it was difficult for the airborne troops to hold the occupied lines. Therefore, when on 20 April the enemy began his offensive against the airborne group, all the aviation of the front was switched over for operations in the Myskhako area. Without the enemy's expecting it, this aviation inflicted two concentrated attacks on his troops.

The first attack on German troops by a group consisting of 60 bombers covered by 31 fighter planes was delivered half an hour before the planned offensive. A second attack followed. In it 52 bombers and ground-attack planes took part under the cover of 45 fighter planes. This resulted in the failure of the "general" attack. Crushing attacks upset the tactical control, routed group HQ and caused the failure of the offensive. True, the enemy undertook a few weak attacks, but they were all repelled completely by the airborne troops.

At this time the main forces of three reserve Air Force groups of the Supreme Command General HQ joined battle. By 23 April the correlation of strength in the Myskhako-Novorossiysk area altered in our favor and an abrupt change in the air situation was created.

From 17 to 24 April alone in fierce combats the enemy lost 152 planes destroyed by fighters and about 30 planes downed by AA artillery. Our losses were half as many.

A most important mission assigned to Soviet aviation was carried out: to prevent organized bomber attacks on troop combat formations. We took over the initiative in the air. Henceforth the ground situation was also influenced by this fact.

The second phase takes first place in Soviet aviation combat operations in the Kuban'. At this very time, when the main front troop concentration, i. e. the 56th Army, was fighting for the liberation of the Cossack village of Krymskaya, a most intense struggle for air supremacy developed. Until then it had been carried on under conditions when the initiative was in the hands of German aviation.

Even before the beginning of the decisive battles for the liberation of the Cossack village of Krymskaya, owing to measures taken by our command aimed at weakening the enemy aviation concentration, conditions were successfully created on the main salient of the North Caucasus front offensive for usurpation of the initiative in the air by Soviet aviation. Besides the destruction of enemy aviation in aerial combats, an important part was played here by the operations of our Air Force against enemy airfields on the Taman' peninsula, in the Crimea, and in the southern regions of the Ukraine adjoining the Sea of Azov.

On 20 April 1943 representatives of the Supreme Command General HQ approved the plan of combat operations aiming at the destruction of the enemy troop concentration on the Taman' peninsula. In order to win air supremacy in the preliminary stage of the operation, this plan provided for assigning 65% of the sorties for the destruction of enemy aviation and 35% for operations against airfields. Thus our

command interpreted correctly the struggle for air supremacy as an indispensable combination of two methods: destruction of the enemy in the air and on airfields.

The plan provided for action against airfields of the enemy concentration which were offering resistance not only to the North Caucasus front, but to the Southern and Southwestern fronts as well. This precluded the possibility of the enemy's bringing in part of his aviation from other directions for operations in the North Caucasus front zone.

The Air Force of this front (the Fourth and Fifth Air Armies) solved the problems of routing enemy aviation up to the Taman' boundary line, at a distance of 100 km from the front line. They used 18% of the resources assigned for attacks on the airfields. The Air Force of the Black Sea Fleet operated against the coastal airfield, located at a distance of 50 km from the front line, using 6% of the general resources.

A group of long-range aviation destroyed enemy aircraft on airfields in the Crimea, 120-300 km away from the front line, and on the most important air junctions of the southern Ukraine at a distance of up to 500 km from the Krasnodar area. For this purpose, 54% of the general resources was assigned. The remaining 22% was used by the Air Forces of the Southern and Southwestern fronts, the objectives of which were airfields in the area west of Taganrog and Donbas.

During the night our Air Force carried out quite effective raids on enemy airfields. Long-range aviation attacks on large airfields in the Crimea were particularly successful; over 100 planes in all were destroyed and damaged. Because of this, on 30 April, the German command was forced to change the base of the 55th Bomber Squadron from the Crimea to the Donbas area.

Before the beginning of our troops' combats for the liberation of the cossack village of Krymskaya, more than 300 planes were destroyed and damaged on enemy airfields. The resisting enemy aviation concentration was weakened considerably. This allowed our Air Force, from the very beginning of the offensive of the 56th Army, to acquire air supremacy and to hold it firmly till 10 May.

A powerful — for that time — softening-up operation by the Air Force preceded the ground troop attack; this lasted for a considerable part of the night between 28 and 29 April. During the night 379 sorties in all were carried out in the Krymskaya village area and about 2000 t. of bombs were dropped on enemy defense objectives.

A daytime Air Force softening-up operation started at 0700 on 29 April — 40 minutes before the beginning of the attack — and afterwards grew into an air support operation.

With the beginning of the offensive of the 56th Army massive use was made of support aviation. In the direction of the main attack, in a zone 25 km wide, 99% of all its strength was operating, despite the fact that the entire length of the front line was 160 km. During the first three hours, 493 crews carried out missions. Never before had there been such a massing of aviation on a limited front sector.

Enemy attempts to submit our advancing troops to organized attacks failed from the very first day of the offensive.

On 29 April alone 1268 sorties were flown. Seventy-four enemy planes were downed in aerial combats and 7 planes were downed by AA artillery fire. On the side of enemy aviation, 539 sorties in all had been noted on that same day, i. e., about half as many as ours. Also on the following day — 30 April — the Air Force of

the front carried on uninterrupted fierce aerial combats which, at times, lasted for hours, with 30-50 or more planes participating on each side. On some days, on a comparatively narrow front sector (25-30 km), up to 40 aerial combats were going on, during which 50-80 enemy planes were destroyed. Soviet pilots courageously fought with the enemy and, fighting stubbornly, they consolidated their supremacy in the air. Owing to this, our ground troops were safely supported from the air.

From the very first day of the operation, Soviet fighter planes forced enemy bomber aviation to operate at high altitudes within 5000-7000 m, to make only one target run, and, in most cases, to drop their bombs without aiming. The combat formation of our patrolling fighters was echeloned in altitude on 2-3 levels and was called "stacking".

At this time fighter aviation consisted mainly of high-speed fighter planes of the Yak-1, Yak-7B, La-5, LaGG-3 type, for which vertical maneuver in aerial combat was fundamental.

The tense air situation required precise control of group aerial combats in the air and from the ground by radio. For this purpose, on an elevation 4 km from the front line, a command post was organized; from here the commander exercised control over group combats and gradual increase of strength.

In this way fighter aviation control in the main attack zone of front troops became strictly centralized. At a distance of 500 m from the main IA [fighter aviation] control and vectoring radio station was located the observation post of the PVO [AA defense] chief. All incoming data about the appearance of enemy planes were immediately transmitted to the KP [command post] by telephone. It was thus possible to take timely measures for repelling an attack as well as to coordinate the activity of the fighters with AA artillery.

Having at his disposal all the data on the air situation, the commander controlled from the KP all the fighter planes over the battlefield. He informed approaching fighter groups about the situation and vectored them to enemy planes; if necessary, he increased strength in the combat, summoning new groups from other areas or from the reserve; he warned pilots of danger, determined errors made by them during combat, and watched the results of the engagements.

With the help of the main control radio station, fighters were, on the whole, successfully vectored to enemy planes; and aerial combats, as a rule, ended in victory for our pilots.

For instance, on 29 April, i. e., on the first day of the operation, the fighter division commander, while at the KP, was informed by the AA artillery defense deputy commander of 12 German fighters approaching the front line. Their mission presumably was to mop up the zone for the operations of their bombers.

At that time over the battlefield was the fighter squadron headed by the now Thrice Hero of the Soviet Union, Maj. Gen. of the Air Force A. I. Pokryshkin. By radio he was ordered to pin down the enemy planes. Soviet pilots swiftly attacked the enemy group and downed 8 planes.

Five minutes after this combat, VNOS [aircraft warning service] posts reported that three large enemy bomber groups were approaching the battlefield. A squadron, under the command of Guards Capt. D. B. Glinka (now Twice Hero of the Soviet Union), was in the air at that time. The Captain was assigned the mission of attacking the first bomber group. In order to beat off the raid, the division commander ordered

two more squadrons from the airfield. One of them was ordered to attack the fighters which had just appeared; the other, not to allow the second enemy bomber group to reach the battlefield.

However, the fighter division commander did not have any additional forces to beat off the air raid of the third bomber group. So, getting in touch by direct wire with the AA defense deputy artillery commander, he asked him to beat off the raid of enemy planes with ZA [AA artillery] fire. This was carried out. Two enemy planes were downed by AA artillery fire; the rest, having dropped bombs on their own troops, disappeared in a hurry.



IN BATTLES

FOR THE MOTHERLAND

Master of Bomber Strikes



The "Petlyakovs" made a circle in the clear blue sky where enemy AA shells were bursting and assumed a combat course. Shell bursts pursued them, flashed now higher, now lower; it seemed they appeared from nowhere in the transparent air. Suddenly the planes began a swift descent. Two bombers were simultaneously on the diving glide path. Soon bombs separated from the planes. Eight bombs hit the target accurately. A huge column of black smoke rose over the steppe. It grew larger and larger. Gasoline stores blew up one after another and more and more columns of smoke rose upwards.

The carefully camouflaged main enemy gasoline supply dump in the region of Morozovskoye was destroyed by a direct dive-bomber hit. This happened in the summer of 1942.

The indefatigable warrior-Communist Ivan Semenovich Polbin led aircraft groups to bomb enemy equipment five or six times a day, and sometimes more often.

I. S. Polbin took part in the liquidation of a Hitlerite concentration encircled near Stalingrad and in the battles for Kursk and Orel. Polbin's dive bombers helped Soviet infantry to liberate one city after another. Polbin's fame as a master of bomber strikes spread along the whole front.

General, Twice Hero of the Soviet Union, Ivan Semenovich Polbin was not only

an unsurpassed master of dive-bomber strikes but also a bold innovator, who made a valuable contribution to the development of bomber aviation. He was a gifted commander-educator and a model Communist.

Thus, a well-organized system of control and coordination of fighter aviation with AA artillery permitted us to foil the raid of large enemy bomber forces. The enemy lost 18 planes; our losses were 4 fighters.

As a result of 285 aerial combats carried out from 29 April to 10 May, 328 enemy planes were destroyed or damaged, i. e., more than one third of the resisting aviation concentration.

But this did not yet mean the final outcome of the struggle for air supremacy on the North Caucasus front in favor of the Soviet Air Force. The air enemy was still strong enough and capable of decisive operations. Realizing this, the command took the necessary measures to maintain supremacy in the air.

On 26 May 1943 ground troops assumed the offensive in the region of Kiyevskoye and Moldavanskoye. This was preceded by 100 minutes of artillery and Air Force softening-up operations. In the Air Force softening-up operation, lasting 40 min., 338 planes took part. They delivered strikes on a front sector 7 km long and about 2 km wide. Our Air Force operated successfully and without any losses.

However, beginning with the second half of the day, the enemy, having carried out a swift operational maneuver, pulled up large aviation forces from other directions, in particular from airfields in the southern areas of the Ukraine, and threw them into the field of combat. As a result, he succeeded in establishing a strength advantage of one and a half times over our aviation and temporarily gained air superiority in the main strike zone of the North Caucasus front.

Fierce air battles were taking place every day on a limited front sector not more than 15-20 km in length. Disregarding great losses, enemy aviation activity was concentrated. The situation became particularly strained. The offensive of our troops stopped.

Having analyzed the conditions, the command took urgent measures for a rapid change of the situation. First of all, the main forces of our fighter aviation were assigned the mission to beat off enemy massed attacks in his own territory long before the groups had approached the front line. With this in view, fighter "hunters" were being detailed for independent operations on distant approaches to the front line. Afterwards it was decided to cut down the composition of close fighter support for the bombers and ground-attack planes, and instead, to provide safer cover for the main troop concentration.

In connection with this, bombers and ground-attack planes began to fly in large groups of no fewer than 50-60 planes with a small fighter escort. Their responsibility for self-defense sharply increased. Now, in expending ammunition, they had to leave no less than 15% of their ammunition supply for beating off attacks of enemy fighters on the way home.

If the situation permitted, escort fighters attacked enemy bombers when they met them on the flight route or in the target zone. But it also happened that while covering the troops, they stayed over the field of combat; and then the bombers and ground-attack planes, after they had carried out their missions, returned to the airfield in-

dependently, or with a small fighter escort.

In addition, night attacks on enemy aircraft on their own airfields were intensified. All this permitted our aviation to recover air superiority in a comparatively short time. Even during the first days of June one could notice a decline in the activity of Fascist aviation which had lost up to 230 planes during only 6 days (from 26 to 31 May).

Soviet fighter planes began anew to operate with great effectiveness. At the end of the third phase of air combats, they succeeded in causing considerable losses to enemy aviation in the Kuban'.

* * *

The importance of Soviet combat aviation operations in the spring of 1943 in the Kuban' went far beyond the limits of the North Caucasus front operations. They were an important step in the struggle for air supremacy on the Soviet-German front and strengthened the power of our Air Force before the decisive aerial combats in the battles near Kursk and Orel.

In aerial combats in the Kuban; in the spring of 1943 the enemy lost over 1000 planes. This resulted in his losing the last advantages in the air which his treacherous assault on our Motherland had given him. "In the fierce aerial combats over the Taman' peninsula and in the battle of the Kursk bulge," the Sovinformbyuro [Soviet Information Bureau] reported, "the former air superiority of German aviation was definitely upset."

The results of Soviet Air Force activity in the Kuban' had a great influence on the development of Air Force tactics and on its operational skill. What new concepts did this experience introduce?

In the course of combats in the Kuban' the most effective tactical methods of aviation operations — particularly of fighter aviation — were worked out and checked.

Soviet pilots started applying on a large scale the basic vertical maneuver in high-speed fighters. Free search ("hunting") proved to be a very effective method of fighting with enemy aviation. Soviet fighters applied such a method as excluding enemy fighters from the target zone three or five minutes preceding the approach of bombers and ground-attack planes (the so called air "mop-up"). Norms of detailing fighter planes for close escort, basing this on a specific air situation, were worked out. Special fighter groups were being assigned to particularly dangerous flight course sectors in order to cut off pursuing enemy planes.

All these methods and tactical procedures widened considerably the offensive capabilities of our fighter aviation and raised the effectiveness of its operations. As to the operational skill of the Air Force, the experience in combat operations of Soviet aviation in the Kuban' cannot be overestimated.

The combat operations of our Air Force proved the correctness of Soviet military theory regarding methods of gaining air supremacy. The leading part in the solution of this problem belonged to the Air Force. But, along with it, other branches of the army and types of armed forces took part in the struggle against enemy aviation. AA artillery operated energetically. Field artillery was applied with success for the neutralization of enemy AA artillery before the strikes of our large bomber and ground-attack groups on targets in the field of combat. Battleships of the Black

Sea Fleet frustrated with their fire the operations of enemy aviation from coastal airfields, inflicting considerable losses.

Air supremacy in the Kuban' was acquired through close combination of aerial combats and fights with operations against airfields. At the same time it became clear that stable results in the struggle for air supremacy could be attained only if it was not limited by the scope of one front only, but covered a vast territory, thus depriving the enemy of the possibility of a wide aviation maneuver. This requires the coordination of the Air Forces of adjacent fronts.

Experience of aerial combats in the Kuban' proved how important is the offensive character of fighter aviation operations in aerial combats and how the level of its effectiveness is raised if the engagement with enemy planes takes place before the front line, over his own territory.

The need for creating in the Air Force a strong reserve of fighter aviation was made evident in the course of the battles. It was proved advisable to have on "duty on airfields" and in the air, not a few outfits in several aviation units, but completely separate aviation units and groups.

In the struggles in the Kuban' a major part was played by a large-scale application of maneuverable fighter groups, part of which engaged enemy fighters and inflicted defeat, while the rest attacked his bombers.

In the aerial struggle in the Kuban' the method of controlling all fighter aviation over the field of battle by means of radio stations set up near command (observation) posts of combined arms commanders was confirmed.



IN BATTLES

FOR THE MOTHERLAND

In Combats with Japanese Militarists

After the defeat of Fascist Germany, carrying out their duty as allies, Soviet Armed Forces began combat operations against imperialistic Japan. Our aviation played a considerable part in the operations which destroyed the Kwantung army, rendering great help to the ground forces.

Our Air Force in the Far East, which had taken part in the routing of the Kwantung army made more than 14,000 sorties in only ten days of combat. They carried on reconnaissance, bombed enemy fortified areas and important junctions, destroyed his equipment and man-power, and made airborne landings.

By 16-17 August the Kwantung army, which included crack troops, was already routed and was no longer an organized military force. Now it was necessary to wipe out the remaining separate centers of resistance and prevent the enemy from taking away or destroying valuable supplies. Airborne troops, helped by transport aviation, carried out these missions.

On 19 August pilot Chetvertakov and navigator Ivanov received the order to land airborne forces in the city of Girin. There was an unbroken overcast all along the flight route. At first they had to fly above the clouds, without visual contact with the ground. But the altitude of the upper cloud layer was rising higher and higher. The crew had to break through the overcast and continue a low altitude flight. Despite complex flight conditions, navigator Ivanov accurately brought the plane to the city of Girin and pilot Chetvertakov skillfully landed the plane on a landing strip of very limited size.

The crew carried out the combat assignment right at the appointed time.

The enemy had dozens of fortified areas, full of powerful fortification constructions. Soviet pilots helped ground troops reduce them.

Here is one example.

On 10 August pilots of a bomber group under the command of Col. M. N. Kalinushkin (now Lieut. Gen. of the Air Force) were assigned the mission of destroying centers of resistance in the Hu-t'ou fortified area.

Dive bombers of the group dealt a powerful bomb strike by squadrons from an altitude of 2000 m. The fierce fire of Japanese AA men did not prevent our pilots from carrying out the combat mission. Attacks with heavy bombs resulted in the destruction of most of enemy permanent fortifications.

Our pilots' skillful and selfless operations helped Soviet ground troops and naval forces to destroy in a short time the important strategic centers of concentration of Japanese militarists and to force them to a complete and unconditional surrender.



Pilots of X unit commemorated the Fortieth Anniversary of the Soviet Army and Navy with new successes in combat training. Here many excellent crews have been trained, among which the leading place is held by the crew of Military Pilot First Class Maj. V. I. Borisov. Communist Borisov is a member of the unit Party Bureau. For his successes in combat and political training he has been awarded the Orders of Lenin and of the Red Banner.

In the photo: Maj. V. I. Borisov (left) with a group of comrades.

Photo by A. I. Dotsenko.

YEARS AND PEOPLE

Lt. Gen. of the Air Force
S. N. ROMAZANOV (ret.)

4. Kiyev ahead

Having defeated the German Fascist hordes near Kursk, Soviet troops developed a powerful advance from the Zapadnaya Dvina to the Kuban'. Each new blow on the Soviet-German front dispelled the Fascist legend about the inability of Soviet troops to advance in summer time.

More and more cities and villages were being freed from Hitlerite troops. Life, freedom, and the soil were being returned to the Soviet people.

Troops of the Southern front were advancing against Taganrog and on 1 September 1943 they liberated it, and by doing so, opened the gate leading to the Donbas. Regiments of the South-Western and Southern fronts combined their efforts, and in less than a week they drove the Fascists completely from the Donbas. In September our troops entered Novorossiysk and liberated the Taman' peninsula.

Troops of the Central, Voronezh, and Steppe fronts were developing their offensive toward the Dnepr. The Hitlerites were planning for a prolonged war. A defensive fortification system was being feverishly set up. Special roles were assigned to natural boundary lines. For the German-Fascist command, the Dnepr was the line along which they intended to stop the offensive of Soviet troops.

Soon our troops along the entire length of the front (it was now called the First Ukrainian) reached the Dnepr. The main line of advance lay in the direction of Kiyev. On 29 September an important railroad junction on the left bank of the Dnepr — Darnitsa — was liberated. The houses and gardens of ancient Kiyev could be seen from here.

It was difficult to seize bases of operation, but it was still more difficult to hold and widen them. Realizing that these bases of operations would serve us as springboard for the leap on Kiyev, the Hitlerites were bringing large forces into counterattacks and hastily pulling up reserves from the rear. By the beginning of October twenty infantry, two motor-



Maj. Gen. of the Air Force
S. I. Nechiporenko (1944)



Capt. V. F. Zudilov (1943)

ized, and seven tank divisions of the enemy were fighting before our front. But if the Hitlerites were staking everything on their struggle for the Dnepr in the Kiyev region, for us too this was a struggle for the capital of the Ukraine, for a complete liberation of Ukrainian soil from the hated Fascist yoke, a struggle for a faster destruction of Hitlerite Germany.

The Bukrin base of operations was one of the decisive ones in the battles for Kiyev. It attracted the special attention of both sides. When in the region of the Bukrin base of operations the scheduled breakthrough on the Rzhishchev-Kanev sector had shaped up, the Hitlerites hastily pulled up new reserves to this spot. They would throw into battle hundreds of tanks at a time in order to beat off the advance of our troops. And then pilots of our Air Force would come to the assistance of Soviet ground forces. Wave after wave of bombers, ground attack planes and fighters would go to the main line of resistance making converging attacks. Each blow from the air inflicted a painful wound on the enemy.

On 12 October a group of nine Pe-2 dive bombers under the command of S. I. Nechiporenko headed for a height at the Bukrin base of operations; it was occupied by the enemy and strongly fortified. One had to paralyze the resisting garrison and create conditions in which our troops would gain possession of the height with little bloodshed.

Bombers dealt the blow. For several minutes bombs rained incessantly on the heads of the enemy troops. Stones, logs, cases of ammunition were flying up into the air. As soon as this fire onslaught was over, ground units began to attack. Fifteen minutes after the bombing, the enemy garrison — 500 men strong — was taken prisoner.

Such was the result of a single raid by a small group. And how many were made every day by Col. Nechiporenko's division alone! In the units of this division fought the Moscow and Stalingrad heroes who had taken part in the aerial combats in the Kursk bulge. For its valour and combat honors the division was called Sredne-Donskaya [Central Don Division]. Its commander, Col. Nechiporenko (later Maj. Gen. of the Air Force) was known all along the front as a daring pilot and organizer of bold bombing attacks.

Approximately on 13 or 14 October the Fascists exerted very strong pressure on the Rzhishchev-Khodorov sector. Large tank and self-propelled artillery units rushed against our main line of defense. Infantry followed them. Strong artillery fire was opened against the enemy avalanche. At the same time, ground attack bombers appeared in the air. They were led by squadron commander Capt. Vasily Fedorovich Zudilov, widely known for his flying skill. Even infantrymen recognized him when he was in the air.

In air raids on airfields and other enemy objectives Zudilov acted on the spur of the moment. Before a sortie he very carefully studied the target location area and its AA facilities and detailed special crews for their neutralization. In the units they always knew that if Zudilov went on a mission, it would be accomplished. This was so during all of Zudilov's 140 sorties. It was so this time, too.

The Germans concentrated their forces for a counterblow in a clearing in the woods. Tanks and motor vehicles were cleverly camouflaged, AA guns pounded on every side. Despite this, ground attack planes descended to hedge-hopping flight, accurately dropping bombs and shooting up the Fascists with cannon and machine guns. Explosions arose everywhere.

Next morning the air raid was repeated. Bombs were being dropped into the very thick of tanks and motor vehicles. The steel monsters of the enemy, the famous "Tigers" and "Ferdinands", were ablaze. A typical episode was told to me by one of the combined arms unit commanders.

After a scheduled attack of our aviation on a fortified enemy garrison, antitank rifleman Pavel Dorokhov approached the regiment commander and said:

"Allow me to go out and get a 'tongue [captured informant]."

"How can you do it by day and in an open place?" asked the commander.

"That is nothing. After each bombing attack they are 'conked', like a fish when you hit it on the head: its eyes are open, but it sees nothing and swims with its belly up."

The commander laughed and gave his permission. Dorokhov crept across the open place to the enemy positions and in a few minutes returned with a "tongue". The Hitlerite was quite unharmed but he really looked "conked." Befuddled, he gazed with bleary eyes but understood nothing.

Capt. I. L. Mogil'chak was awarded the distinguished title of Hero of the Soviet Union for his outstanding service in the battles for the liberation of Kiyev (1943)



Regimental Deputy Political Commander Maj. N. P. Trifonov (1943)



was the adventure started by Hitler and they suffered keenly at the sight of the approaching collapse. A similar break was also apparent in the fighting spirit of German-Fascist soldiers.

Severe combats were going on near Kiyev. The Hitlerite command evidently understood that to lose Kiyev was tantamount to losing the whole of the Ukraine, and meant their having to fight on their own, not someone else's, soil. That is why the Fascists tried to do their best to hold on to the capital of the Ukraine.

While one part of our troops was holding and extending the Bukrin base of operations, the other part was carrying on a bitter fight for the widening of the Lyutezh base of operations. Here the enemy added new reserves and tried to stop the advance of Soviet troops. Fierce combats flared up on each sector, individual villages changed hands several times during a single day. Again pilots rendered invaluable help to ground troops. There were days when army commander, Lt. Gen. S. A. Kravsovskiy diverted almost all the army forces from one base of operations to another. Pilots of the 235th Ground Attack Air Regiment particularly distinguished themselves one day. In the areas of the village of Priorka and the Petrovtsy railroad station air reconnaissance detected a great massing of enemy troops. Evidently Germans were preparing their next blow here. Two "II" groups of twelve planes each took off for the areas of concentration. One group was led by Senior Lt. Ivan Mogil'chak, the other by Senior Lt. Dyl'ko. The ground attack planes were escorted by twelve fighters.

At the target approach our planes were met by strong AA fire. Six AA batteries were firing. Yet the Soviet ground attack planes were moving on to their targets. Eighteen German "Focke-Wulfs" tried to attack them on their flight route, but most of these attacks were beaten off by the escort fighter planes. Courage and stamina helped ground-attack planes carry out a brilliant mission. Afterwards it was ascertained that they had destroyed several tanks, over 30 motor vehicles, one AA and one field battery. This attack is typical because our ground attack pilots exhibited in it exceptionally high moral and combat qualities. We have known many instances when the lauded Fascist aces, having but noticed in the air some Soviet fighters, or having encountered AA counterfire, swerved from the flight course and beat it home. Doing so they dropped their bombs helter-skelter. Our pilots acted quite differently. They carried out combat missions even when this seemed difficult impossible. The more difficult the situation, the more skill, keenness of wit and military stratagem was displayed by our fighter, ground attack and bomber pilots. I remember well a story told by deputy regimental political commander, Maj. N. P. Trifonov, a bomber pilot well known all along the front, who was designated to head the group when it carried out a very responsible mission.

Early in the morning, at a signal, the bombers took off into the air. Visibility was excellent: the autumn sky, infinitely deep blue and transparent, seemed to have been washed by the rains. While approaching the Dnepr the pilots saw the front line. From behind a hillock enemy artillery was pounding in the direction of Soviet troops. Our ground units were storming a large inhabited point. The German defense line ran through it. Their artillery positions were located southwest of the village.

When the group approached the target the Germans spotted it and opened strong AA fire. Six shells burst right in front of Maj. Trifonov's plane and his aircraft

passed through the crests of the bursts. Trifonov applied the snaking maneuver with a 10° - 15° corrective turn. Such corrective turns are hardly noticeable from the ground and are one of the best means of executing an AA evasion maneuver. Over the target he led the group in a straight line. Navigators dropped their bombs from an altitude of 1600 m.

Taking into account the strong AA countermeasures, the bombers altered their initial plan of a second approach and, having made a right turn, they came in from the southeast, at the same time having increased altitude by 500 m. The calculation was correct. The AA men had no chance to deploy and open fire before the group had finished bombing. Planes were coming out of the sun, which made observation from the ground difficult. And while they were withdrawing from the target, the AA fire did not harm them at all.

In both bomb runs the bomb bursts neatly covered the target. Enemy artillery was suppressed.

Maj. Trifonov was not only a good bomber but also a good political worker, thoughtful, resolute, and he did not like to waste his words. I do not know a single important combat operation in which this courageous man did not take part.

All through October intense battles were going on at the bases of operation. The pilots of our army carried out 280 aerial combats in which they downed 206 German planes. Our Air Force groups also suffered great losses: — 109 planes did not return to their airfields. Two thirds of this number were fighter planes.

Here it will be apropos to say a few words about the peculiarities of the work of army headquarters during the combats for the bases of operation. The first days already revealed the exceptional complexity of the operational management of Air Force units and subunits. The headquarters of large commands could not direct small groups operationally and precisely; this was even truer of individual pilots. Frequently there were errors, resulting in unjustified losses. Under these conditions army commander Gen. S. A. Krasovskiy made the only valid decision: fighter units, intended for bomber and ground attack plane support, were to be subordinated to the strike aviation commanders. Now things were going better. Coordinated action became precise, and air cover more reliable. There was less hustle and bustle in army headquarters as well as in corps and division headquarters. A business-like tempo was immediately restored in the combat activity of all units and groups.

One can mention one more peculiarity of the Kiyev operation — the great tension in the work of rear outfits. Events in the Kiyev region were developing rapidly; rapid transfers of large groups, including Air Force units, were being made. Under these conditions the soldiers of the rear acted as true heroes. Even now I remember well one episode. My car broke down on the way to the airfield. I stopped a vehicle which was going my way and asked the driver for a lift to where the pilots were. He agreed willingly. As soon as I got into the cab the driver drove his ZIS-5 at high speed. I wondered at the skill of the operator who so smoothly drove the car along the poor road.

"What is your name?" I asked him.

"Yegor Pomeschchikov!" he answered.

"Really! Pomeschchikov!" I said thoughtfully.

"Yes, Comrade General, I was Pomeschchikov [pomeschchik = landowner], but now

I am ... a Soviet man, and like everybody else a fullfledged citizen. And there is no longer even any trace of a landowner. So there!"

I looked at his sunburnt face and thought of his many fellow drivers who drive their vehicles along many frontline roads, forgetful of rest, not counting on a reward.

"You have a new vehicle," I said only to break the silence.

"What are you saying, Comrade General! I used it when I was still working in the kolkhoz."

"In the kolkhoz?" I asked amazed.

"Sure! When I was drafted into the Army I said: 'Give me my own machine! I will go all through the war with it, and will bring it back like new.'"

I looked at the speedometer: it showed a high figure, but the vehicle still seemed brand new.

"You will keep your promise", I said quite sincerely and with conviction and I thought that with such men it is impossible not to win.

The men of the rear area outfits, men like Pomeschchikov, brilliantly coped with their difficult task — they supplied the troops at the front with all they needed. In the course of a few days 6950 tons of fuel and lubricant and 8000 tons of ammunition were brought to the Air Army dumps alone.

The most important stage of the battle for the Dnepr was approaching: troops of the First Ukrainian Front were aiming their blow at Kiyev.

November was beginning. The eyes of the Soviet people were turned to the capital of the Ukraine. Kiyev, the largest political center of the country, a huge railroad junction, was an object of strategic importance.

The conception of the final operation was interesting. During the struggles for bases of operations the Fascists were definitely convinced that the main blow of our troops would come from the Bukrin base of operations. The most typical feature of Prussian strategy was becoming evident: dull stubbornness and conservatism. Once they had become convinced of something, it was difficult for them to change. Yet it is doubtful that any of the German generals were making any such attempt.

All the better for us. It was clear to our command that once the enemy expected us from the southern base of operations, we would strike from the northern. For the sake of this plan a daring maneuver of mobile forces was undertaken. By dawn of 2 November, unbeknownst to the enemy, one of the tank armies was transferred from the Bukrin to the Lyutezh base of operations. This was done in the true Suvorov way: under the very nose of the enemy a whole tank army was "rolled" to another place. Soviet tanks came out into the area of Lyutezh and the Petrovtsy railroad station under a thick fog cover. Here, in the woods, behind the infantrymen's back, tankers made ready for an assault.

A Guards corps under the command of Gen. Baranov approached the Lyutezh base of operations just as stealthily and took cover in the woods.

What kind of mission did the pilots of the Air Army have? It was simple to put it into words: with all means available, to support the main forces of our troops which were preparing to liberate Kiyev.

The Air Army commander issued a special order, assigning a specific mission to each Air Force group.

Yet everything can be planned, except the weather. Already during the last days

of October it suddenly became worse and on some days the ceiling was zero. South of Kiyev and over the Black Sea cyclones were forming and moving north and northeast. Anticyclones, advancing from Siberia, hindered their motion. Having lost mobility, the air masses hung over the Dnepr areas, produced clouds and precipitation, fog and drizzle. It seemed as if nature herself was also preparing to test the pilots.

On 1 November units of Soviet troops began breaking up the German defense at the Bukrin base of operations. All measures were being taken to create the impression that the main direction of combat operations was right here. The offensive began with a strong artillery preparation; then our bombers and ground attack planes appeared in the air. The weather was unfavorable: low overcast, slight rains here and there. But even under these conditions the pilots successfully carried out their assigned mission. Hugging the ground, the ground attack planes came in at tree-top level. Dive bombers darted out of the cloud cover right over the target. They fired on artillery batteries, on pockets of resistance, they destroyed engineer fortifications, technical facilities and enemy man-power. As soon as the planes had finished their "working over" at the main line of resistance, ground units rushed to the offensive.

The demonstration of the false offensive was proceeding successfully. Already on the second day the enemy decided that Bukrin was the main direction and began to shift his forces from the north to the south. Our air reconnaissance instantly detected the transfer of troops and immediately informed the front command.

On the night preceding 3 November the right flank of our Kiyev task force came to life. In the sky one could hear the incessant rumble of aircraft — of Soviet night bombers. For the infantrymen this was the first sign of an approaching offensive. According to the plan of coordinated action night bombers "worked over" enemy positions in the zone of the projected Soviet troop operations. Pilots of the night bomber air division carried out more than 200 combat sorties, dropping bombs and leaflets on enemy positions in the regions of Goryanka and Pushcha Voditsa.

At dawn artillery raised its voice. This time the artillerymen brought down on the enemy a fire of unprecedented violence. For three minutes, shells rained incessantly on the enemy's main line of resistance. Then for half an hour the artillerymen neutralized the predetermined objectives by shifting the fire deep into the enemy's line of resistance.

At the termination of artillery preparation the Air Force joined in the operation. Air Force units and groups were delivering the main blow in the regions of Pushcha Voditsa, Goryanka, Mostishche, Priorka. The first blow was delivered by 103 ground attack planes and 64 bombers. A whirlwind of fire and metal rose over enemy fortifications, scattering about concrete, timber, and earth. The Germans, stunned by such a squall, hastily diverted their fighter aviation attack. But they did not succeed in hindering the pilots of our army. During 3 November alone, Air Force units carried out 1145 sorties.

The offensive of our ground units was developing successfully. The onslaught of the First Ukrainian Front troops was growing stronger. Already by the end of the first day of the offensive the enemy began to withdraw to the south and southwest.

The day of 4 November was cloudy and the ceiling was zero. Aircraft were shackled to the ground, whereas ground units continued to move forward. It was

more difficult for them without any support from the air, but the speed of the advance was not decreasing. The pilots knew how much their help was needed by their comrades-in-arms and, gazing sadly at the low-hanging clouds in the sky, they waited for the signal to scramble. On 5 November, despite bad weather, the Air Force commander ordered the planes to take off.

This was a gloomy autumn day: a gray and cloudy sky, oozing mud on the roads, wet ruins, bare trees. But the heart of each Soviet warrior rejoiced: we all felt the approach of October celebrations, the closeness of victory.

The northern flank of our task force was constantly moving towards Kiyev. Vanguard units had already come quite close to it and were preparing for the last push.

The enemy, fiercely "snapping" back, was retreating toward Zhitomir and Vasil'kov. Air Force pilots were given a new mission: not to let the enemy withdraw from Kiyev with impunity.

Ground attack planes and bombers, despite low overcast and poor visibility, rushed at the retreating columns. Soviet pilots destroyed the enemy wherever possible: along roads, at railroad stations and river crossings, on railroad stretches, at road crossings and in spots difficult to traverse.

Enemy fighters tried to hinder our Air Force operations, but air supremacy was completely ours.

Having received substantial air support, ground units reached the last line of enemy defense by the end of the day on 5 November. They broke into Gostomel', took Chelini station, reached the northern and western outskirts of Kiyev. On 5 November tank army units poured into the breach and headed for Fastov and Vasil'kov. One part of the tank army force proceeded to encircle Kiyev.

Tanks and armored vehicles were rushing toward the city, infantrymen were running with sub-machine guns at the ready. Everywhere the war-cry "Give up Kiyev!" was ringing.



Maj. Gen. of the Air Force
A. V. Vorozheykin (1956)

All night long — a dark November night — raged the battle for Kiyev. Foreseeing their defeat, the Hitlerites conceived a monstrous crime: to destroy before their retreat one of the most beautiful Soviet cities. They began to blow up houses, to set fire to anything that would burn. The sight of the burning city gave rise to a wave of hatred in Soviet warriors and increased their ardor for driving ahead. This is what pilot Senior Lt. Strelkovskiy said about it:

"On the night of 5 November I received a mission to bomb the retreating Hitlerite troops on the Kiyev-Zhitomir highway. The weather was still foul. To shorten time I decided to fly cross country over Kiyev. To tell the truth, I was also very eager to take a look at it this night.

"I flew at an altitude of 900 m. Even from a distance one could see the tongues of fires and, later, smell an acrid odor. The city was full of AA guns firing from all sides; but I hardly noticed them, so great was the sorrow and anger I felt during

those minutes. On the bank of the Dnepr stood a four-story house; tongues of flame were escaping from its windows, and, farther away, fires stretched in unbroken lines. I did not know the layout of the streets, but with a pain in my heart I thought 'Kreshchatik is burning', and my hand involuntarily reached for the throttle. I wanted to reach the target even more quickly in order to finish off the brutal enemy.

"Our tankers cut off all the enemy's avenues of retreat. On the railroad tracks there still stood troop trains which had arrived from Germany, and Soviet tankers had already broken into Svyatoshino — the western suburb of the city. Fascist pogromists fled from Kiyev, leaving behind their weapons and equipment.

"Though the city had suffered badly, yet it was saved from destruction. On the morning of 6 November the entire country heard the words of the long-expected order: 'On this 6 November at dawn, as the result of a swiftly carried out operation with a bold enveloping maneuver, troops of the First Ukrainian Front took by storm the capital of Soviet Ukraine, the city of Kiyev, a great industrial and a most important strategic center of German defense on the right bank of the Dnepr...'"

The Kiyev operation is one of the glorious pages in the military art of the Soviet Army. The struggle for Kiyev was characterized by the impetuosity of its operations, by the perfectly coordinated action of all arms. In the course of two flying days Air Force units carried out 3500 sorties. During the final stage of the battle scores of dogfights broke out in the sky over the city and over the bases of operations. The enemy lost 84 planes in these air combats. Our losses amounted to 26 planes.

The combat successes of our Air Force units and groups were mentioned in the order of the Supreme Commander-in-Chief. It ran thus: "The following units especially distinguished themselves: Col. Vitruk's 291st Voronezh Ground Attack Air Division, Col. Nechiporenko's 202nd Sredne-Donskaya Bomber Air Division, Maj. Gen. of the Air Force Baydukov's 4th Guards Ground Attack Air Division, Lt. Col. Klubukov's 264th Ground Attack Air Division, Col. Gerasimov's 256th Fighter Air Division, Lt. Col. Chupikov's Eighth Guards Red Banner Fighter Air Division, Col. Yuzeyev's 208th Red Banner Short-range Night Bomber Air Division, Col. Sryvkin's Tenth Guards Stalingrad Fighter Air Division, Maj. Gen. of the Air Force Lakeyev's 235th Stalingrad Fighter Air Division."

A number of army units and groups were granted the honor of bearing the name of "Kiyevskiy" [of Kiyev].

In the battles in the Kursk bulge and in the Ukraine many of our pilots distinguished themselves. Maj. A. V. Vorozheykin, a fighter-pilot, Hero of the Soviet Union,



Maj. Gen. of the Air Force
A. S. Kumanichkin (1957)

and already famous in Khalkhin-Gol, further added to his score of kills of the enemies of our Motherland.

Following his favorite rule — to attack the enemy at close range — Vorozheykin in this war brought his number of downed enemy planes up to 52. For participating in the battles for the liberation of Kiyev he was awarded a second Gold Star medal.

Nikolay Varchuk, commander of the 737th Fighter Air Regiment fought courageously in the same engagements. While forcing the Dnepr he downed 14 enemy planes on his own and 9 in group combats. He and Aleksandr Kumanichkin, who had downed 16 planes, were awarded the title of Hero of the Soviet Union after the liberation of Kiyev. The same high award was received by about twenty pilots of our army.

Hundreds of commanders, political workers, technicians, engineers, soldiers of all the specialities, were awarded orders and medals of the Soviet Union.

Troops of the First Ukrainian Front, breaking desperate enemy resistance were moving west to the borders of our Motherland. Pilots of the Second Air Army in combat cooperation with front ground troops set about sweeping the whole Soviet Ukraine of Hitlerites.

... Far behind the warriors of the advancing Soviet Army flowed the dark waters of an autumnal Dnepr. Dozens of cities and hundreds of villages of Pravoberezhnaya [right bank] Ukraine were awakening at the break of a new day, free from the invaders' yoke.

ORDINARY PEOPLE

ANAT. KHORUNZHIY

One warm Sunday, along with a stream of Kiyev townspeople who were admiring the autumn foliage, I set out in search of a cottage in which I was interested on the outskirts of the city. All along the way I thought of those strangers whom I had to see.

The house stood on a side-street where the branches of apple trees and pear trees, heavy with fruit, hung down from all the front yards over the shrubbery of the hedges onto the sidewalk. Opening the gate, I saw two whitewash-spattered men stripped to the waist. They were dragging a cumbersome, old-fashioned oak chifferonier across the threshold of the house. The entire yard was crammed with household utensils and furniture, and a little black dog was blissfully sleeping on the seat of a soft armchair.

When I asked whether I could see Pilot Grigoriy Danilovich Kudlenko and his wife, the older of the two, a man forty years of age with a scratch on his shoulder, let down his end of the dresser and slowly wiped his right hand on his pants.

"I am Kudlenko", he said. "And as for our wives, they will hardly be back soon. Isn't that so, brother?"

"I guess so, yes", affirmed the younger brother, sitting down on a chair and obviously glad of the respite.

It turned out that the brothers had let their wives go visiting today in order to be able to organize a Sunday project for household tasks. This was Grigoriy's idea. Ever since he was little he has liked carpentering, plastering, repair-work and installing windows, and when he starts work of this kind he cannot stand to be disturbed. But nevertheless this time it was necessary to interrupt work for a while.

They say that everything a man has experienced shows in his face. However, as Grigoriy Danilovich and I walked about the rooms and he discussed the quirks of stoves, and later, in the garden, while we were tasting the juicy pears, I could not see anything remarkable in the face of this man who had gone through so much during the war years. But when, stopping by an old well, Kudlenko finally began to speak of the war years, his face suddenly came to life and immediately reminded me of those pilots whom we rightly referred to as bold falcons in our communications from the front.

What the former squadron commander began to talk about was much broader than our notion of "combat experience". He communicated his interesting ideas on the

Ordinary People

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role of a combat ace in the training of young pilots, on the characteristic features of a fighter, on the art of introducing novices into action, and on the personal example of the commander. Everything he said could be used as valuable material for a series of articles or notes by a veteran commander. Listening to him I again thought of how very useful a large collection of the memoirs of veterans, compiled now when the events of the Great Patriotic War have receded into the past, would be.

A little later I asked Kudlenko to tell me about his wife, aviatrix Klavdiya Mikhailovna Blinova.

"I feel a little awkward talking about my wife", he replied with embarrassment. But after a short silence he began to speak.

"It was in the fall of 1942 on the Kalinin front. In our regiment, as everywhere, the pilots were exclusively men. And suddenly two girls appeared on our airfield in flight uniforms and with chart boards. Who were they? Why were they here? All decided that they had made a forced landing somewhere nearby. There had been such incidents before. But it turned out that this was not the case. The chief of staff sent for the squadron commanders and informed them that two women pilots, having through insistence obtained a transfer from the PVO [AA defense system] service to the front, had been sent to the regiment as replacements.

"Well, who will take them on?" he asked.

"I must confess that we commanders were taken aback, because women had always been considered poor pilots.

"I had a strong squadron, well trained as a flying team, and the chief of staff rested his gaze upon me. I got it. That same day I flew into the zone in pair with the quiet, tall, blond girl — Blinova. I had never yet had such a co-flyer in all the five years of my flight experience. Taxiing out for the takeoff I did not feel exactly cheerful: the plane of my lady wingman was moving somehow too close to mine.

"Gaining altitude, I looked around: her plane was just as close as before. 'Even if she relaxes her attention for a second', I thought, 'she'll run into me.' I carried out several complicated advanced piloting maneuvers with just about one objective — to break away a little. But I noticed that my lady co-flyer was not lagging behind me a bit. On the contrary, the more I elaborated the flying, the closer she hugged me. My nerves couldn't take it any longer and I said:

"You could keep a little greater distance. What's the matter, are you afraid of losing your lead plane?"

"I am not afraid of anything," Blinova calmly replied.

"The next day Blinova went on a combat mission. There was a lull on our sector of the front then, and under the comparatively quiet conditions the girls quickly fell into the routine of frontline pilots.

"Klavdiya Blinova flew as wingman for almost a year. She helped many out in combat, but somehow no one was able to help her when the 'Fokkers' crippled her. True, the circumstances of that battle were, as I was later told, very complex."

"Excuse me, didn't Blinova come under fire while covering your aircraft and rescuing you?" I asked.

"No. Not exactly. At the time they shot her down I was lying wounded in the hospital. Klavdiya was flying in pair with another pilot but she came to see me quite often. To tell the truth, it may be that she really did save me, yet it wasn't

from enemy attacks in the air, but rather it was with her sympathy and concern and with kind words spoken at the side of my hospital bed." Heaving a sigh, Grigoriy Danilovich continued:

"There were many difficult days in Klavdiya's life. Of course, when she bailed out that time, she was taken prisoner. I got to speak with one of the pilots with whom she escaped."

"How did that happen?" I asked.

"After the end of the war our regiment was stationed at an airfield near Berlin. As I was walking past the parking area for military transport aircraft a pilot called to me. He asked whether I knew a lady pilot by the name of Blinova. I didn't let on that she was my wife, but only said that I knew such a person. Then he began to shower Klavdiya with praise. He told how they, together with other escaped prisoners, went by night through forests and swamps toward the front line, how some of them were ready to stop in a village and wait until spring, but how she convinced them all to continue the journey. He said that he owed his life to Blinova and that he wanted very much to see her. I had to disappoint him by informing him that Blinova was not in the regiment now. I did not mention, moreover, that she had given birth to a daughter and was living at her mother's in a village near Moscow..."

Our conversation was interrupted: two little girls ran through the gate and joyfully rushed to Grigoriy Danilovich. The older of the two was a skinny, blond, blue-eyed girl, and the younger one was tawny, with dark braids. Two women came in after them. Looking at the older girl it was not difficult to determine which of the two women was her mother — Klavdiya Mikhaylovna Blinova.

We were introduced. A few days later Klavdiya Mikhaylovna told about herself. She recalled how, along with the other girls from a village near Moscow, located near an airfield, she used to dream of becoming a pilot; how they joined an aeroclub and did not grudge either their free days or evenings in order to learn to fly.

"Only a few of us were lucky enough to fly in combat aircraft and even fewer to fight with the enemy in the air. And now," she said with a certain amount of sadness, "I have become a homemaker, a mother, a wife. Of course, I left my favorite work a little too early; I should have flown a little longer."

"But you have seen a lot. You have something to tell others" — I was about to encourage Klavdiya Mikhaylovna.

"Everything is forgotten, forgotten — that's what hurts! While we were making our way as a group from captivity to the front line, one of us, I remember, said by the night campfire, 'If we get out of here alive, we'll have to write a book together after the war about our experiences'. And I thought then: 'Yes, and write about it all in detail; tell how one person gave confidence to another, gave him strength at moments when he seemed ready to give up out of a feeling of hopelessness.'"

"And did you have such a feeling?"

"How can I tell you... When I found myself alone in the open country in occupied territory, and Hitlerite soldiers were running toward me from all directions, for a split-second I thought of suicide. But I immediately discarded this idea. 'No, I shall be with my own people again!' I decided. I attempted to run but they wounded me in the foot and caught me. I asked the boys surrounding me what village we were near. They told me, but I immediately forgot its name. The Hitlerites tore off my 'For Bravery' medal, my Guards Badge, and my shoulder boards, along with

pieces of my tunic. Photographers and correspondents gathered like a flock of birds. Even some sort of Fascist general came to look at the Russian girl pilot.

"While they were taking us prisoners by train somewhere into the deep rear, traveling in one freight car, we decided to escape. At first the men kept their agreement a secret from me: 'Why', they said, 'take such a burden upon ourselves? She won't be at all able to keep up with us'. I understood what they were whispering to each other and tried to convince them that I would not be a burden to them.

"One of our comrades had a hidden penknife and with it we planned to cut a hole through the side of the car in order to put a hand through and bend back the catch on the doors. We all took turns working on it. I would not let anyone have my turn, although they tried to take my place.

"After a few days and nights the hole was ready. During the night we opened the car, and all of us, one after the other, jumped out onto a slope while the train was in motion. I jumped out right behind two pilots. It was dark, pitch-black. Going along the embankment a little way I stumbled upon my comrades; there were three of them and later we picked up one more. Sazonov, Rybalko, Polyakov, and I have forgotten the name of the fourth, the very one for whom I dressed a serious side wound throughout the entire journey.

"For two weeks we wandered through the Bryansk forest until we heard shots in the forward area. It was cold spending the night under bushes in the fall. We would lay the wounded and the weak, as a rule, in the middle, in order to keep them warm. During this hard journey it was found that some did not have sufficient endurance and persistence for carrying out our common plan. Some began to urge us to stop in some village and to wait for the arrival of our troops there; others considered it necessary to take a rest for several days. Someone even suggested going to the nearest city and applying for work at a German airfield as unskilled laborers in order to steal an aircraft and fly over to our side.

"I did not agree and tried with all my might to oppose these delays which were caused by nothing more than fatigue. And every time, after a heated argument, we would all come to the original decision: for all to keep going and going together toward the front line.

"For a day and a night we sat in the forward area. Shells and mortar flew over us; a German patrol would pass by and our side would fire at it. We endured even this.

"When we crossed the main line of resistance each one went to his own unit. All were drawn by the desire to see their comrades, to return to duty and to fight again against the enemy; and I, in addition to this, was drawn by love..."

"Where those comrades are now, I don't know. Grigoriy told me once that some pilot asked about me at the Berlin airfield. It seems that he was the one who had the serious wound. How nice it would be for us all to get together! Frontline soldiers who have undergone such severe trials together should write to each other. One doesn't want the friendship of people who got to know each other well during the great war to die out. What a feeling — the complete confidence of one person in another! What a force it is!..."

A few days later I saw Kudlenko and Blinova in the city with their children. They were choosing a coat for their older daughter at a store counter. Then they went down the street — she, a slender, beautiful woman in a light blue dress, and he, a

slightly limping, middle-aged man who still preserved his military bearing.

I followed them with my eyes and thought of how rich our country is in real people who go just like that, shoulder to shoulder, in both adversity and in joy, doing much good in the name of our Motherland.

Forty Years in the Air Force

Among aviators the name of Docent and Candidate of Military Sciences, Maj. Gen. of the Air Force D. N. Morozov is widely known.

Forty years ago, like many other revolutionarily minded soldiers, Morozov joined the ranks of the Red Guard. During the days when Petrograd was threatened by danger, he participated as a member of the Twelfth Air Force Detachment in the struggle against Kerenskiy's counter-revolutionary troops. Soon after, Dmitriy Nikolayevich Morozov transferred to the Red Army and devoted himself to the cause of defending the achievements of the Great October Socialist Revolution.

In 1919 D. N. Morozov fought against the English interventionists who had invaded Arkhangel'sk. And in 1920 he made his way to the Western Front where he immediately fought with the White Poles at Smolensk and Minsk.

After the Civil War the young Soviet commander, while training and instructing personnel, himself studied persistently. On 25 May 1936 the TsIK [Central Executive Committee] of the USSR awarded D. N. Morozov the Badge of Honor "for outstanding personal success in the mastery of combat aviation equipment and for the skilful direction of combat and political training..."

D. N. Morozov devoted much work to the cause of training Air Force cadres. As an Air Force Academy teacher he not only skillfully conducted the educational process but also concerned himself with working out a series of problems related to the direction of Air Force combat operations.

During the hard days of 1941 when the Fascist German invaders treacherously at-



tacked our Motherland, D. N. Morozov made his way to the front. From the first to the last day of the war he was a member of the field forces. The units commanded by D. N. Morozov received several expressions of gratitude from the Supreme Commander-in-Chief for distinction in combat. The activities of Gen. Morozov were also highly valued. As a skilled military commander he was awarded during the war years two Orders of the Red Banner, an Order of the Patriotic War, first class, two Orders of Bogdan Khmel'nitskiy, second class, and the Order of the Red Star.

In the fall of 1945 D. N. Morozov again returned to his teaching work and became the head of one of the departments of the Air Force Academy. During the post-war years, along with an increase in speeds there arose the problem of organizing the control of fighter aircraft, and of vectoring them to targets. D. N. Morozov took part in its solution. In 1946 he wrote a study of the control centers of fighter aviation groups and at the same time solved problems involving technical design of command posts.

D. N. Morozov, keeping in step with the development of aviation, has written several scientific works which are a great contribution to working out the organization of the control of present-day fighters in combat.

On the Fortieth Anniversary of the Soviet Army (and for D. N. Morozov it is a double holiday — forty years have also passed since the day of his entry into its ranks), we would like to wish him good health and further success in his productive activities.

In the photograph: D. N. Morozov.



Squadron Commander Maj. D. A. Lysakov skilfully instructs and trains young pilots. He has been elected a member of his unit Party Bureau.
 In the photo: Maj. D. A. Lysakov (right) is engaged in a flight critique.
 Photo: T. N. Mel'nik



Daring

Lt. Col. F. A. VAZHIN

I

Air exercises were going on. Interceptor fighters one by one disappeared into the darkness of the night. They shot up into the air so that they might come up to the "enemy" bombers and prevent them from reaching the defended objective. The command post and all the crews worked efficiently and all bombers were intercepted. The darkness of the night did not help them. The high skill of the fighter pilots made the mission successful.

Guards Lt. Col. P. P. Panchenko was satisfied with the results of the activities of his subordinates. He himself had flown to intercept an "enemy" plane and attacked it with success.

Besides the professional feeling of pride of a fighter pilot for his branch of aviation, Panchenko was also struck by another thought. It was the sentiment of a patriot deeply concerned about the might of his socialist Motherland:

"But were the bombers really sufficiently protected against defeat?"
 On many occasions, both day and night, the first-class pilot had to intercept air

targets under the most trying conditions. And he began to ponder this more and more often. Actually, in an engagement with fighters, the main weapon of bombers at night and in the clouds is maneuver and fire. But maneuver under such conditions, especially in combat formation, is limited to a certain degree. The fighter plane is always more maneuverable than the bomber. It has greater freedom in the choice of place and time of attack and, consequently, it is capable of achieving an element of surprise.

Present-day detection facilities make it difficult for the bomber to take advantage of darkness or overcast. It is "seen" by ground radar stations which vector interceptor fighters, as well as by the attacking pilot on his radar sight.

That is why Panchenko more than once asked himself the question: "Is there no possibility of insuring the safety of bombers flying at night and in the clouds by using close fighter escort?" The solution of this question, extremely important for bomber aviation, will likewise expand the combat capabilities of the fighter planes flown by Panchenko and pilots under his command.

This experienced officer, without a doubt, understood that this was a highly complicated matter that would call for great effort, high skill, and other additional concern on the part of the pilots. But would a Soviet soldier be deterred by a difficulty when it was a matter of raising the level of combat readiness?

Panchenko expressed his opinion to Lt. Col. Z. B. Totrov, political deputy regimental commander, and was backed up by him.

"The problem, without a doubt, is complicated and momentous. Much will have to be done to work these questions out theoretically. It will be necessary, Petr Petrovich, to walk unknown paths. Even practical testing will require exceptional skill of the pilots."

"I think we can rely on our people. Let us speak, Zakhariy Bimbulatovich, to the Communists. They can think about it and then we can get together and discuss the question again."

The pilots whom Panchenko spoke with approved the idea of escorting bombers at night and under adverse weather conditions. There were some who reacted with reserve.

"The idea is good," they would say, "but other tasks confront us, and this might divert us from fulfilling the plan. And besides it is a very complicated matter. The slightest inadvertence may lead to disastrous consequences. No one, as everyone knows, is patted on the head for flying accidents."

"That is true," thought Panchenko. "Every circumstance must be weighed and taken into account. Only then can a decision be made." And the officer decided as his Party conscience prompted him.

II

Petr Petrovich Panchenko is younger than the Soviet Army which will be 40 years old on 23 February. Only from accounts of his seniors does he know of the hard lot of the people under capitalism. The story about his grandfather Vlas made a deep impression on him. Vlas, as the old folks said, had been a hardworking man; but he still lived and died in poverty.

The Great October Revolution of 1917 set the man free. The sons and grandsons

of grandfather Vlas breathed freely again and stood up with weapons in hand to defend the great achievements of October.

Petr Panchenko's father joined the ranks of the Soviet Army immediately after its organization, fought the White Guards near Petrograd, defending the cradle of revolution. In the years of the Great Patriotic War he fought against Hitler's invaders and died the death of a hero.

In 1943 Panchenko's son, a graduate of aviation school, came to the front to replace his father. In bitter combat the young pilot matured. He engaged in battle for his native Soviet Land, and served his country faithfully.

Once Panchenko, together with Capt. Lukoshko and Lt. Krutoy, took off on a combat mission. Having met a group of bombers, the Soviet pilots plunged violently into attack. In running attack, Capt. Lukoshko set the enemy plane on fire. But at this moment the aerial gunner of another bomber opened fire on him. Panchenko rushed into attack to save the commander and with a well-aimed burst downed the Fascist. The remaining enemy planes hurried back to their own territory.

Nevertheless the enemy gunner succeeded in putting Capt. Lukoshko's plane out of action and he was obliged to parachute to safety. Panchenko and Lt. Krutoy circled around the slowly descending commander. The thought disturbed them: "Where will he land? On enemy territory?"

The situation on the ground was changing rapidly at the time. Sometimes our units drove deeply into the territory occupied by the enemy, while enemy concentrations remained in their rear. Panchenko looked at the map. Judging from the trace



P. P. Panchenko

of the front line, the area over which aerial combats took place was occupied by Fascists. The pilots came down to hedge-hopping flight, trying to solve the problem that was tormenting them.

They saw their commander land among the yellow unharvested fields. Quickly deflating the parachute, he dug himself in, ready for defense. How were they to save the commander? Panchenko began to look for a level landing area in order to pick him up and get him out. He had extended the landing gear and was gliding in for a landing. People from the village were running towards Lukoshko. "I've got to make it!" — the thought flashed through his mind. But then the pilot saw the commander indicate by hand gestures: "Our own people are here. Return to the airfield." Having made a farewell circle, the pilots flew off.

In the evening they met the commander. The Captain embraced Panchenko and said affectionately:

"Well, you are a really desperate fellow. And what if Germans had been there?"
"But you would have acted the same way," answered Panchenko.

After this incident pilots often said:

"Panchenko won't let anyone down in a combat. He is a miner, and miners, as it is generally known, are strong and friendly folk."

Once, returning from a combat mission, Panchenko saw a pair of Messerschmitts attack a Soviet pilot. The plane had already been damaged and the pilot could hardly fight off the enemy. Two more enemy fighters were approaching the scene of action.

"That will be the end of him..." thought Panchenko.

There is a sacred law among Soviet men: Perish yourself, but rescue your comrade. With a sudden violent running attack he downed the enemy plane.

"Withdraw from action! Withdraw!" Panchenko transmitted over the radio, covering the withdrawal with impetuous attacks. One attack followed another; the damaged plane in the meantime was flying to friendly territory. Panchenko was running out of fuel. With a vigorous maneuver he withdrew from action and returned safely to the airfield. Soon a telegram was received from a neighboring unit. The regimental commander thanked the pilot with a light blue number seven (tail number of Panchenko's plane) for saving an officer and a combat aircraft.

In the years of the Great Patriotic War, Petr Petrovich Panchenko made 300 combat sorties. Nine Fascist planes met their end in his well-aimed fire. The combat achievements of the pilot have been highly appreciated by the Motherland and he has been decorated with two Orders of the Red Banner, the Order of the Patriotic War, first class, two Orders of the Red Star, and several medals.

In the post-war period the courageous pilot was one of the first to master the jet fighter. Already in August 1947 he flew a jet plane at a parade celebrating Air Force Day. In "Pravda" a picture of a group of pilots appeared with the following caption: "Heroes of the Great Patriotic War — Participants in the Parade." Panchenko was among them.

To the combat decorations of the pilot additional decorations were added for mastery of new combat equipment in the post-war period and for high combat skill. The additional decorations were: Order of Lenin, two Orders of the Red Banner, three Orders of the Red Star. Recently by order of the Commander-in-Chief of the Air Force Lt. Col. Panchenko received a valuable present. These awards testify to the fact that the war hero in time of peace devoted all his capacities to strengthen the might of his Motherland.

The Motherland and the Soviet People highly prize the merits of their defenders. The working people of a regional town elected Petr Petrovich a delegate of the City Soviet. The officer devoted much effort to community activities, being on the City Soviet Board of Education.

Recently the Board dealt with the case of Kolya Skripnik, a fifth-grade student. The boy set out daily for school, but never showed up there. His aged father and mother were unable to influence him. The Board considered the case and asked Panchenko to speak to the boy.

Petr Petrovich went to the boy's house and found him at home.

"Hello! Let's get acquainted", he said simply and introduced himself.

Kolya looked with surprise and curiosity at the high-ranking officer, on whose

broad chest there glittered several rows of decorations on holders.

When the officer explained why he had come the boy became apprehensive. Petr Petrovich caught the piercing look of the school-boy, but, pretending not to have noticed it, he sat down on a chair offered by the hostess and began a conversation with her.

The conversation was of life, work, family.

"I too," began Panchenko "because of my youthfulness dropped out of school after the seventh grade. Wanted to be a miner, to break records. But I took good advice in time and enrolled in a FZU [industrial training school]. After graduation I worked in a mine... And now I am a pilot..."

The boy listened to the conversation with interest. Then he began to ask the officer questions. In some ten minutes they were carrying on a spirited conversation.

Panchenko managed to have a heart-to-heart talk with Kolya, to find out his interests, his opinions, and then to persuade him of the necessity of continuing his studies. The boy promised to improve and is now studying diligently.

The activity of Guards Lt. Col. Panchenko, an officer-Communist, a soldier-delegate, and a soldier-citizen, is many-sided and diverse. No matter what he takes in hand, his seething energy manifests itself everywhere.

III

... The jet plane was flying to intercept an aerial target. Lt. Col. Panchenko strictly maintained the flight regime prescribed by the command post. It was as though the plane hung in mid-air in the night haze, and only the quivering instrument pointers showed that the plane was rapidly gaining altitude. Shreds of clouds flashed by and the sky, like a gigantic dome studded with numerous stars, opened up above the plane. At a given altitude the pilot changed over to horizontal flight and took the required course.

Soon he heard the familiar voice of the ground controller.

"Target ahead, range..."

Panchenko involuntarily took his eyes off the instruments and looked ahead. Clouds loomed below, and above was the star-studded sky. Spotting the target visually in such conditions was out of question.

From the command post it was reported that the target was within detection range. Soon a blip began to appear on the scope. Having vigorously closed in on the "enemy" bomber, Panchenko attacked it successfully. After opening "fire" the pilot did not, as is usually the case, withdraw from attack in a turn. Having notified the command post, he fell somewhat behind the target and allowed it to pass to the left at a small azimuth angle. Having flown for some time in such a position, Panchenko began to turn left, still tracking the target on the scope. In this manner the pilot maneuvered close to the bomber, evaluated and checked his visual judgement of the close bomber escort.

When the occasion presented itself Panchenko repeated all this during other sorties. With every mission the belief in the correctness of his supposition became stronger. The combat capabilities of a fighter plane were likewise studied in great detail during these flights and important and valuable conclusions were drawn as to its utilization in combat. The pilot was convinced that the radar equipment permit-

ted not only trailing the bomber, but also maneuvering within certain limits.

The pilots worked hard on the ground too. Many officers became interested in the idea of fighters escorting bombers at night and under adverse meteorological conditions. An active part in the realization of the idea was taken by the most experienced military pilots first class in the unit. They were Majors P. S. Suvorov, V. F. Yuzefyak, V. A. Sukhostavskiy; Captains F. G. Petrov and Yu. M. Zakamskiy; Military Pilot Third Class Senior Lt. M. Ye. Golod, and others. There were lively discussions. Diagrams were made. It was necessary to define not only the possibility of fighters escorting bombers, but also to find out, at least in a preliminary way, its effectiveness and, consequently, its advantage. After a definite opinion had been formed, the setup of combat formations of the escort was considered. Different versions were taken into account. All this was done on the basis of deductions made from the performance characteristics of fighter planes and certain inferences made by pilots in the course of regular flights for aerial target interception.

It is natural that theoretical reasoning had to be verified in practice, in flight. But how was this to be done?

Intensive training flights as scheduled were going on at the regiment. The pilots were mastering a high-speed fighter plane. Many of them had not as yet become thoroughly familiar with it. For escort flights under adverse meteorological conditions and at night the pilot must be exceptionally well trained. Consequently it was still necessary, Panchenko inferred, to work hard to raise the pilots' qualifications. They must be trained to utilize fully the combat capabilities of the plane and, in particular, to escort bombers.

Soon an occasion presented itself to verify the theoretical suppositions in practice. The fighter air regiment under the command of Lt. Col. Panchenko was assigned a training mission of covering bomber combat operations at night. It was, of course, possible to support the bombers in the usual way hitherto used.

Lt. Col. Panchenko could not, after all, afford to miss a convenient opportunity to implement the idea which had been worked upon for some time by the pilots of the unit. Having consulted his subordinates, he made a bold decision to accomplish the task of closely escorting bomber combat operations.

Lt. Col. Panchenko confided his idea to Hero of the Soviet Union, Col. G. V. Gromov. The topnotch officer backed him up and gave him valuable advice for organizing flights.

Preparations began. Lt. Col. Panchenko invited Maj. Yuzefyak, Capt. Petrov, Senior Lt. Golod, and other officers, who would be faced with the task of flying escort to come to the classroom. He suggested that ideas be exchanged to find the most efficient way of rendezvousing with the bombers to be escorted, to define the most advantageous overall combat formation and the combat formation of fighter planes when rendezvousing and escorting. In the course of these discussions many questions were raised which it was essential to solve before going aloft. In the course of the discussions the officers reached unanimous agreement as to the sequence in accomplishing the task. Only after that did the flight personnel begin the preliminary preparations for the flights. Every detail was definitized; all air operations were reasoned out in the greatest detail; different variants were outlined in the event of a change in the air situation, failure of equipment, etc.

At last the long-awaited day came. Lt. Col. Panchenko was the first to taxi out to the flight line. Hardly had his plane vanished in the darkness of the night, when

the planes of Maj. Yuzefyak and Capt. Petrov zoomed into the air. The experienced pilots quickly formed on the lead plane. The first wingman flew right behind the leader and the second wingman behind the first. On Panchenko's plane the radar station was set for target sweep. The command post vectored him to the bomber; his wingman followed him. Soon, the pilot reported to the command post: "I see the bomber"; and he began to reduce speed to formate onto it. The wingmen likewise began to reduce speed, but with a certain lag. The fighter planes formed on the escorted plane and took up the combat formation which had been decided upon on the ground.

The pilots evaluated this combat formation, took note on the radar sight scopes of the position of the blips of the planes flying ahead. They determined the possibility of maneuvering to repel an attack of "enemy" fighters, considered whether it was possible to retain combat formation in case the escorted bombers should maneuver.

First flights confirmed a series of suppositions worked out by the pilots and at the same time introduced many new factors.

On the following day the flying personnel assembled for a critique of the flights. On the basis of this detailed analysis some valuable conclusions were made concerning the rendezvous of fighter planes and the way they formate onto bombers, concerning combat formation, etc.

Making use of diagrams, Lt. Col. Panchenko analyzed the operations of the fighters when flying escort.

"The flights have proved", he said, "that it is possible to escort bombers at night and under adverse meteorological conditions. Taking the first experience into consideration, the problem must be further elaborated upon."

Maj. Yuzefyak proposed that the lead plane warn the wingmen immediately after sighting the bomber to be escorted. This would make it possible for them to reduce the rate of closure in good time, maintain combat formation while forming on, and provide for the safety of the flight. He also suggested increasing the distance between the fighters.

"Radar stations", said Senior Lt. Golod, "must be switched on as early as possible so that after takeoff at the moment we formate on the lead plane they will be ready for operation."

Other thoughts were also expressed. This clarified many of the problems involved in escorting. Nevertheless, further elaboration and practical verification were needed, especially in the methods of repelling enemy fighter attacks.

The search continued. After a certain time another opportunity to escort bombers at night presented itself. This time more complicated problems were posed. "Enemy" fighters had to attack the bombers, and the escorting fighters were to fight off their attacks.

Panchenko understood that in organizing these flights he was taking great responsibility on himself. But no difficulty was great enough to hold back the Soviet commander once he was convinced that all this was necessary to promote combat readiness of the Soviet Air Force. He depended on the pilots and knew that they would be able to cope with the tasks confronting them. By this time many pilots of the unit had thoroughly mastered their planes and had been trained to the level of pilots first and second class.

Lt. Col. Panchenko invited Lt. Col. Totrov and the Secretary of the Party Bureau and told them of the forthcoming training exercises.

"As you see, it is a complicated matter", said the commander. "Let us consider and discuss the question of how to mobilize the personnel to carry out the training in an exemplary way."

A Party meeting was held in the regiment. Each Communist was required to serve as an example in the execution of his duties.

The political deputy and members of the Party Bureau consulted with Lt. Col. Panchenko when they were drafting a plan of Party-political work for the period of the exercises. Panchenko took a most active part in carrying out the plan. The commander was very busy during those days. He himself flew on missions and in spite of that found time to speak to many of his subordinates.

Communists — commanders of sub-units, engineers, pilots, staff officers — exert strong influence on all the fighting men. Everything new and advanced that emerged in the course of the flights became the common property of the flying personnel and was discussed with animation. The Communists were the pioneers in all the undertakings and the propagandists of what was developed and verified in practice.

Communists Yuzefyak, Petrov, Zakamskiy and others shared their experience and gave advice to their comrades on how best to execute a mission. The exercises were instructive and well organized.

Particularly significant was the flight of Maj. Yuzefyak and his lead pilot, Military Pilot First Class Capt. V. P. Boyko. Taking the experience of previous flights into consideration they formed rapidly on the escorted bomber. The night was dark and because of that the pilots were able to maintain combat formation and carry on the search for the "enemy" only with the help of radar sights.

An "enemy" fighter tried to sneak up on the bomber. The escorting pilots watched their screens closely and spotted the attacking fighter in due time. It was closing in at high speed, but, in spite of that, Maj. Yuzefyak managed to attack it.

Much valuable information was derived from these flights. Pilots that escorted the bombers and the "enemy" pilots gathered for flight critique. This made it possible to analyze in greater detail the operations of the fighters, and bring out the most efficient methods of escort and of repelling "enemy" fighter attacks. In addition to that, the officers suggested a number of valuable improvements in aviation equipment.

Thus the creative approach of Lt. Col. Panchenko and pilots under his command produced new tactical methods and methods of operation. Not to be satisfied with his accomplishments, but rather to go on seeking and daring is the characteristic trait of the first-class pilot, topnotch commander, and warrior-Communist. This is the trait of the new Soviet man, the builder of Communism, nurtured in our glorious Communist Party.

The Heroic Deed of a Commissar

These were the last days of July 1941. Both on the ground and in the air hard fighting continued incessantly.

On one such day Squadron Commander A. A. Tormozov and Commissar N. M. Dudin were patrolling in an area where our troops were crossing the river.

The pilots flew across the river and headed northwest. At a highway and railroad intersection Tormozov and Dudin made a left turn. At this very moment four "Messerschmitts" appeared from behind the clouds and rushed to the attack.

On noticing the enemy planes, Dudin immediately flew in his nimble I-16 to meet them. An unequal aerial engagement began. A short burst of fire and one Me-109, after an abrupt dive, went down. Two Soviet fighters boldly attacked three Fascist planes. The latter, having a speed advantage, disappeared for a time and then tried either to get on the tail of our I-16's or to strike from above.



N. M. Dudin

Tormozov's plane began to burn and the "Messerschmitts" directed their attacks on Dudin. They were joined by another Me-109. The Soviet pilot, making use of the superior capabilities of his plane in horizontal maneuver, broke away from the enemy encirclement and plunged into attack again. At that moment one of the Fascists managed to get on Dudin's tail. But Tormozov, with a sharp sideslip, shook the flame from the wing of his plane, and was just in time for the rescue. He shot up the "Messerschmitt"; it burst into flames and fell to the ground like a stone. Tormozov's plane was also damaged and he landed among our troops.

Commissar Dudin continued to fight with the enemy. Tension steadily mounted. Two Me-109's got on the tail of Dudin's fighter and began to dive at him from different directions. Dudin turned vigorously and went in for a head-on attack. The enemy opened fire. Dudin pressed the firing button; a burst — and the machine gun was silent. The ammunition was expended. "Retreat? Never! Ram him!" Dudin decided. An enemy bullet wounded him but he made a sharp turn and ripped into the wing of the enemy fighter with his prop. The Me-109 leapt up, heeled over on its wing, and fell to earth.

On 22 October 1941 the title of Hero of the Soviet Union was conferred upon N. M. Dudin.

Friendship Born in Battle

In 1943 when Poland was under the yoke of the Fascist occupation the "Warsaw" fighter air regiment was organized on Soviet soil.

Polish patriots who were ready to fight with arms for the liberation of their Motherland joined it. Lt. Col. Jan Taldykin, an experienced pilot, was the first commander of this regiment. The Soviet country armed the Polish warriors with combat equipment.

The banner of this celebrated unit bears witness to the feats of the officers and men of the "Warsaw" air regiment. It is adorned with the "Virtuti Militari" — the highest Polish military order. Many pilots, besides receiving decorations from their own governments, have also received Soviet decorations. Officers Kalinovskiy, Khoronzhey, Yakubik, Shvarts, and others shot down several Fascist planes in the first aerial engagements. Their portraits and combat efficiency reports have now been placed on a display stand in the combat glory room of the regiment.

The unit veterans tell the young warriors of the combat deeds of their regimental comrades in the fight against Fascism. During the war Polish and Soviet pilots were often based on the same airfield, flew together on combat missions, and close friendship sprang up among them. The veterans of the regiment recall these days. On more than one occasion Military Pilot Second Class, Lt. Stanislaw Mel'charek has told about the Soviet pilot Nikiforov, who fought for the liberation of Poland in 1945 and was his first teacher and mentor.

The illustrious combat traditions of the regiment are enriched by new achievements of the pilots in combat and political training. They are striving for a high showing in mastering the latest aviation equipment now at their disposal in its combat application under adverse meteorological conditions both day and night. Maj. Lyutsian Kalkus, Capt. Zigmunt Chayka, Lt. Stanislaw Mel'charek have set an example in this respect.

In their military training, Polish aviators avail themselves of the rich experience of the Soviet Air Force pilots. They are the welcome guests of our aviators, while Soviet pilots are welcome in their regiment. Friendship, born in combat, grows stronger and increases in the common fight for the triumph of the great ideas of Communism.



Commander of a topnotch bomber element, Capt. V. F. Fedayev was awarded the Orders of the Red Banner and of the Red Star for his successes in mastering combat equipment.
Photo: Yu. N. Skuratov

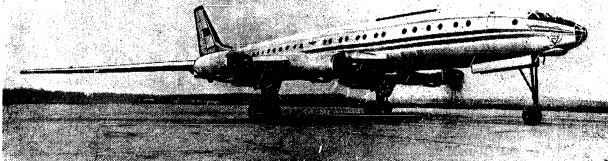
THE FASTEST PASSENGER PLANE

A. A. Arkhangel'skiy
Hero of Socialist Labor

Not forty years have gone by since the first Soviet plane was built. During this span, the science of aviation has made great strides forward. It has solved many problems in the field of aerodynamics and strength, engine-building and instrument making. Scientific and technical achievements have made it possible to improve considerably the quality of aircraft which, by their performance characteristics, had by the time of the Patriotic War already proved to be better than enemy aircraft. Especially outstanding successes in improving aviation equipment have been achieved by Soviet scientists and designers in the postwar period.

Not so long ago, for example, we were witnesses to the birth of many new air transport ships, to the flight of combat fighters at speeds considerably exceeding the speed of sound, to the establishment of a world record in carrying capacity and

In the photo: the new Tu-114.



A. A. Arkhangel'skiy

The Fastest Passenger Plane

99

in altitude of flight with load by a Soviet helicopter with turboprop engines.

The development of the Tu-114, Il-18, and AN-10 passenger planes, mighty bombers, and supersonic fighters speaks eloquently of the fact that in the field of jet aviation our Motherland has won a leading place.

The Communist Party and the Soviet government have never spared means and resources for the needs of science. Its development has become a most important state matter. The Leninist course of industrialization of the country, of priority for the development of heavy industry, has created the conditions for a comprehensive expansion of investigation in all fields of science, for the extensive utilization of its achievements in practice. At the same time, in connection with technical progress in industry, science has been and is confronted with ever newer and newer problems that require the quickest possible solution.

Together with all of industry and science, the aircraft industry and its contiguous branches is growing steadily and aviation science is developing.

Are our successes in aircraft building fortuitous isolated scientific-engineering records?

They are not! Such successes are unthinkable in individual, isolated fields of science and technology. In our country the development of science is proceeding along a wide front.

All of these successes are a triumph of the socialist order. Such tremendous achievements in such a short space of time became possible only by virtue of the active and selfless labor of workers, engineers, fliers, and scientists, by virtue of the advantages of the Soviet socialist order.

Military, like civil, aircraft building belongs among those branches of production that, utilizing the achievements of science and technology, are developing with particular rapidity. For this reason, postwar aircraft building should be considered in close relationship with the enormous progress that has been achieved in metallurgy, electronics, automation, chemistry, etc.

Hundreds of people of many occupations participate in the creation of a modern airplane. This work is done by many designers, scientists, and specialists in the most diverse branches of science and technology.

As high-speed aviation develops, of ever greater importance is the special equipment that helps the pilot to operate the plane and to carry out combat assignments, that supplies power to the numerous mechanisms, instruments, and assemblies, that creates normal conditions for the work of the crew at high altitudes. Automatic systems of control at different stages of flight have come into widespread use. Solutions have been found to the problems of air conditioning the cabins of planes, of cooling their power plants and other equipment.

Radio equipment makes it possible for the crew to maintain reliable communica-



B. T. Goroshchenko

tion with the ground and with other aircraft in the air, to identify invisible obstacles on the flight path, to detect the enemy under conditions of poor visibility, to reach an assigned point of the route. In addition, it facilitates landing at night and under adverse weather conditions.

To operate an ultra high-speed plane in flight, to deflect the control surfaces, requires considerable effort. This work is successfully being done by various kinds of hydraulic mechanisms.

Modern jet aircraft have not merely surpassed the speed of sound but are even flying successfully at high supersonic speeds. High speeds are no longer the exclusive domain of fighter planes. Jet engineering has made it possible to bring the speed of bombers right up to that of fighters, to raise the speed of transport planes to 1000 km/hr and over.

Aviation is an important means of transportation. The present-day economic and social life of a nation cannot be imagined without air communications. In our country with its vast expanses, aviation helps to solve a multiplicity of problems which could not otherwise be resolved.

As we have already said, in recent times the Soviet Civil Air Fleet has been supplemented with modern new passenger planes with turbojet and turboprop engines.

Our team, headed by General Designer A. N. Tupolev, has been working on the development of high-speed passenger planes with a high carrying capacity and a long range. At the present time, flight tests are being made of the high-speed Tu-114 passenger liner built for the Fortieth Anniversary of the Great October Socialist Revolution.

The Tu-114, in which the achievements of Soviet aviation science have been embodied, is a cantilever monoplane with a sweptback wing and empennage, and with four turboprop engines of great power. It is designed for

carrying passengers, baggage, mail, and other freight both on the air routes of the Soviet Union and on international lines.

In its normal version this plane carries 170 passengers; in long-distance intercontinental flights the number of passengers is 120; while on such routes as those from Moscow to the southern resorts of the Caucasus and Crimea, the number of passengers is increased to 220. A large quantity of freight is stowed in the baggage compartments of the cabin.

Excellent thermal and sound insulation, comfortable seats, and a system of forced air in the cabin, with the pressure, humidity, and air temperature held constant, ensure 10 to 12 hours of non-stop flight from Moscow to such far-off points as Vladivostok, Peking, Rangoon, and New York. Conditions are such that the passengers do not experience any excessive fatigue.

Installed on the Tu-114 are the latest facilities for navigational, radio-navigational, and automatic piloting which make it possible to fly at any time of day or night.



V. F. Bolkhovitinov

By virtue of its high carrying capacity, long range, and high speed, and also because of the economic operation of the turboprop engines on this plane (in comparison with other types of engines), the cost of flying will be reduced considerably and will not exceed the cost of traveling by railroad.

In size and in number of passengers and quantity of freight carried, the Tu-114 is the largest plane in the world. The turboprop engines installed on it, designed by Hero of Socialist Labor N. D. Kuznetsov, have a considerably greater power than any in existence abroad. This is the fastest passenger plane.

The high level of training of Soviet scientists and technical personnel has made it possible for the Soviet Union to solve successfully a whole series of very complex problems in the field of civil and military aviation.

As in the past, progress in domestic aircraft building has gone hand in hand with the development of industrial production in the country, so in the future the building of aircraft will continuously develop and move forward, satisfying the newly emerging demands of our Motherland.

Honorary Titles for Scientists

Working in the units and groups of the Air Force, at aircraft plants, and in scientific research institutes are hundreds of alumni of the Red Banner Order of Lenin Military Air Engineering Academy named in honor of Professor N. Ye. Zhukovskiy. Created in the early years of the building of the Soviet state, the Academy has for 35 years been training highly skilled personnel for Soviet aviation.

Former pupils of the Academy — V. S. Pyshnov, S. V. Il'yushin, A. I. Mikoyan, A. S. Yakovlev, V. F. Bolotnikov, and many others — have worked out a whole series of pressing problems in aerodynamics and aircraft building. The beginning was made in the development of many new designs and very interesting studies have been conducted within the walls of the Engineering Academy. Its professorial and teaching staff has conducted considerable scientific research work in various fields of aircraft and engine building, and has given constant assistance to the units and institutions of the Air Force.

The achievements of the Academy and its leading professors have been highly regarded by the Presidium of the Supreme Soviet of the RSFSR, which has awarded the title of Honored Worker in Science and Technology of the RSFSR to Professor,



V. A. Semenov

Doctor of Technical Sciences, Maj. Gen. of the ITS [Engineering and Technical Service] V. F. Bolkhovitinov (see page 100), to Professor, Doctor of Technical Sciences, Maj. Gen. of ITS B. T. Goroshchenko (see page 99), to Professor, Doctor of Technical Sciences, Maj. Gen. of ITS T. M. Mel'kumov (see page 102), and to Professor, Doctor of Technical Sciences, Maj. Gen. of ITS V. A. Semenov (ret.).

SOME PROBLEMS OF ROCKETRY

Maj. Gen. of ITS [Engineering and Technical Service]
T. M. MEL'KUMOV
Honored Scientist and Technologist,
Professor, Doctor of Technical Sciences



T. M. Mel'kumov

The achievements of rocket building in the USSR are immense and indisputable. In August of 1957 the successful launching of an intercontinental ballistic rocket was accomplished, the missile accurately hitting the designated target. On 4 October the world's first artificial earth satellite was launched. It weighed 83.6 kg and was equipped with radio transmitters and power sources. A second satellite having a 508.3 kg payload was launched on 3 November. The latter contained instruments to measure cosmic radiation, the roentgen and the ultraviolet short-wave radiation of the sun, pressure and temperature. It also contained radio transmitters, as well as a container with a dog, an air-conditioning system, a supply of food, instruments for monitoring the life processes of the animal in flight, a telemetering device for transmitting all of the measured data to earth, and sources of power.

Despite the considerable weight, the second satellite was raised to an altitude (about 1700 km in apogee) twice as great as that of the first satellite.

The whole world was shaken by these facts which bear witness to the high level of scientific and technological development in our country; this was made possible only because of the far-sighted policy and the wise leadership of the Communist Party of the Soviet Union.

These successes are explained by the presence of fully formulated ideas and the material prerequisites for their implementation. As is known, the concepts of liquid fuel rocket motors, interplanetary rocket vehicles, artificial satellites, as well as many others, were enunciated by K. E. Tsiolkovskiy as early as 1903. These

same ideas were under development by Yu. V. Kondratyuk. His methods of computation (of velocity and acceleration) differed from the methods used by K. E. Tsiolkovskiy (the work method). Yu. V. Kondratyuk proposed the use of a solid propellant for the rocket (lithium, boron, aluminum, magnesium, silicon), outstripping in this respect the work of many other researchers.

In December 1923 F. A. Tsander, independently of Yu. V. Kondratyuk, proposed using the above-mentioned type of propellant for the liquid fuel rocket motor, including the combustion of the emptied tanks made of these materials. He developed a theory of rockets — including finned rockets — (as did Yu. V. Kondratyuk); a theory of liquid fuel rocket motors; and he carried out some experiments with motor models. Since 1928 V. P. Glushko has been successfully working in the field of research on, and development of, liquid fuel rocket motors. The heritage of ideas handed down by K. E. Tsiolkovskiy, Yu. V. Kondratyuk, and F. A. Tsander was developed by their successors, S. P. Korolev, M. K. Tikhonravov, Yu. A. Pobedonostsev, V. P. Vetchinkin, L. S. Dushkin, A. G. Kostikov, A. M. Isayev, A. I. Polyarnyy, and others. We take pride in the fact that all basic ideas in the field of construction of liquid fuel rocket motors and rockets, as well as their individual application in atmospheric and outer space were first advanced and developed by scientists of our Motherland.

The scientific wealth of our country in the field of rocketry produced fruitful results as soon as the Soviet people, led by the Communist Party, created the necessary material conditions. Industrialization of the country, training of a highly qualified army of workers, technicians, and engineers of various specialties, the creation of large research and design teams, wide support of new, technically sound ideas — all this made it possible to build up the huge scientific, technical, and economic potential, thanks to which our country logically became the leader.

Let us turn to those failures which were experienced by the USA. As is known, two attempts in 1957 at launching the intercontinental ballistic rocket "Atlas" ended in failure. The third attempt made on 18 December 1957 ended in the rocket's crashing at a distance of a few hundred miles from the launching pad.

The widely-publicized three-stage "Vanguard" rocket, which was to launch a satellite weighing, at first, 10-12 kg and, later, 1.5 kg, was readied for launching at the beginning of December after a number of postponements. In the presence of a great number of representatives of the press from many countries and of specialists of various departments, the rocket crashed and exploded while climbing. The results achieved in our country are proof of the complexity of the problem and at the same time are an indication of the tremendous successes and the high general level of scientific and technical development of the Soviet Union.

It must also be pointed out that Soviet artificial satellites are launched at an angle of 65° to the equator, whereas the Americans planned to launch theirs at a small angle of inclination to the equator in the direction of the earth's rotation. The weight of the satellites being the same, launching at a greater angle to the equator requires greater energy and, consequently, presents a more complicated problem. This is easily seen if the fact is taken into account that the satellite already has a speed of 1700 km/hr in the plane of the equator due to the rotation of the earth. A satellite launched at a 90° angle to the equator with the same orbital velocity as a satellite which moves along the equator in the direction of the earth's rotation must acquire an additional velocity of about 1700 km/hr in order to climb to the same

height.

A satellite orbit inclined at a 65° angle has an additional advantage in the fact that, with the plane of this orbit being constant with respect to the fixed stars, the trajectory of the satellite is displaced towards the west with every revolution by about 24° . This makes it possible to observe its motion from all continents which lie approximately between the northern and southern polar circles.

In recent years a great number of theoretical and experimental studies have been made in various countries, many rocket types have been built, hundreds of launchings of high-altitude rockets for research purposes have been made, special measuring equipment and equipment for telemeter transmission of data have been developed.

Rockets can be made in different dimensions and for different purposes, military as well as peaceful. Depending on their application, they can be single-stage (simple) and multi-stage (compound). To provide the necessary thrust, each stage of the rocket has one or more rocket motors. If great thrust is required and the period of operation is comparatively lengthy, the motors operate on liquid fuels and oxidizers; if the time of operation is short, the rockets operate on solid fuel.

At present, rockets with two and three stages have been built. The thrust of a single modern liquid fuel rocket motor reaches 450 tons. It was exactly with the help of one of these two-stage rockets that an altitude of 390 km was reached in 1949.

Fig. 1 shows a simplified diagram of a three-stage rocket. Tail fins (for flight stabilization) may be absent; but in this case the liquid fuel rocket motors of the first and the second stage are mounted on hinges. When the rocket axis deviates from the planned trajectory, the control elements turn the motors in such a way as to produce a small angle between the exhaust stream and the rocket axis; this produces a moment relative to the center of gravity of the rocket, and the rocket returns to the planned trajectory.

The nose section of experimental rockets houses a great number of different instruments to measure various quantities. The readings of these instruments are transmitted through a telemetering device to the ground receiver stations. If the rocket is used for putting a satellite into an orbit, then the instruments and the transmitting device are located inside the satellite. The nose section of a rocket intended for military purposes serves as a warhead.

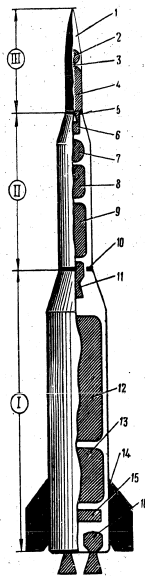


Fig. 1. A three-stage rocket: 1-nose section; 2-the satellite; 3-exploding mechanism for separating the satellite; 4-solid-fuel motor; 5-exploding device for separating stage III from II; 6-rocket control apparatus; 7-tank with helium; 8-fuel; 9-oxidizer; 10-exploding device for separating stage I; 11-liquid fuel rocket motor of the second stage; 12-oxidizer; 13-fuel; 14-tail fins; 15-turbine pump assembly; 16-liquid fuel rocket motor of the first stage.

Animals (dogs, monkeys, mice) have been lifted in experimental rockets, and their behavior during the entire flight has been registered by instruments and by a motion picture camera. The nose section of the rocket, where instruments and experimental animals are housed, can be detached and can descend to the ground with the help of special parachutes.

High-altitude research rockets, anti-aircraft rockets for air defense, and short-range rockets have now been fully developed and are series-produced in a number of countries.

Construction of an intercontinental ballistic rocket with a range in excess of 8000 km and with target accuracy, as well as the development of an artificial earth satellite, present considerable difficulties. These problems were first solved in the Soviet Union.

The basis of the ground-to-ground rocket — especially of an intercontinental ballistic rocket — and of a rocket for launching artificial satellites, is a liquid fuel rocket motor. In some stages (especially in the last), a rocket motor working on solid fuel can be used as well.

In Fig. 2 are shown two design versions of a liquid fuel rocket motor. In version A, fuel and oxidizer are fed into the motor's combustion chamber by forcing them from the tanks with compressed air or some inert gas — nitrogen for instance. There are rockets in which the fuel (alcohol) and the oxidizer (liquid oxygen) are forced out of

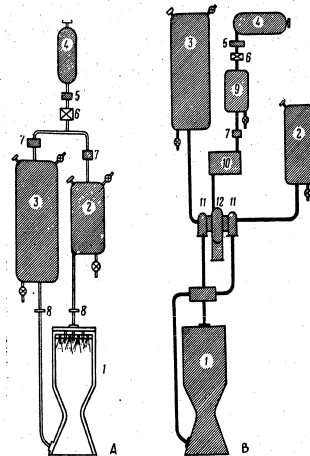


Fig. 2. Principal liquid fuel rocket motor designs: 1-combustion chamber; 2-tank with fuel; 3-tank with oxidizer; 4-compressed air bottle; 5-control valve; 6-reduction valve; 7-check valves; 8-exploding membranes or control valves; 9-peroxide tank; 10-vapor generator; 11-pump; 12-turbine.

the tanks by gaseous helium under great pressure.

In version B, fuel and oxidizer are fed into the chamber with the aid of special pumps driven by a turbine. The turbine operates either on combustion products of the motor's main components, or on vapor, obtained by breaking down concentrated peroxide in a special vapor generator. In it water, steam and oxygen are produced at a temperature of 400° to 500° C in the presence of a catalyst (30-35% aqueous solutions of permanganates of potassium, sodium, and calcium).

If the turbine runs on combustion products of the motor's main components, their ratio must be selected in such a way as to generate heat of acceptable temperature before the turbine.

Version A with bottle feed is used for liquid fuel rocket motors of comparatively small total impulse; otherwise the weight of the bottles, which are under high pressure, becomes excessive.

Design B is used for liquid fuel rocket motors with large total impulses. In this case the main fuel and oxidizer tanks are made so much lighter that, despite the weight of the vapor generator with its tanks and turbine pumps, this design is preferable to the bottle feed design.

The sequence of operation in a liquid fuel rocket motor is as follows. The fuel and oxidizer are fed continuously into the combustion chamber in required quantities through a system of spray injectors located in the head of the motor. Here they are atomized, vaporized, and mixed, forming fuel mixtures. In combustion, gaseous products are produced with a temperature of 3000°C or higher which flow out through the nozzle at a high velocity (2500m/sec and higher). The pressure in the chamber at a given rate of consumption and temperature of gases depends on the minimum cross-section of the exhaust nozzle; the smaller this cross-section, the greater the pressure in the combustion chamber and the greater the exhaust velocity of gasses from the nozzle — all other factors being equal. When some fuels and oxidizers are combined, they form hypergolic mixtures (for instance, Tonka and nitric acid). In other cases, artificial means of ignition (chemical, electrical) can be used in starting the liquid fuel rocket motor.

The processes in the liquid fuel rocket motor are quite simple in design, but are essentially very complicated. To make the rocket effective, the motor must produce the required thrust over a certain period of time, with the least possible weight and dimensions not only of the engine itself, but also of the elements of equipment and control auxiliary to the engine (tanks, turbine pumps, pipe lines etc.). Fulfillment of this main requirement involves high economy and ideal efficiency of the process, on the heat conductivity of the propellant mixtures used in the motor, and on the weight density of these mixtures.

Ideal efficiency of the process means that a given system of working substances completes the chemical reactions in a minimum volume of combustion chamber, and that the exhaust process takes place with minimum losses. Motor economy requires ideal efficiency of the process and, in addition, a correct choice of combustion chamber pressure on which the exhaust velocity of the gases and, consequently, the thrust of the motor depend. At the same time, the fact must be borne in mind that pressure in the combustion chamber determines the weight of the motor and of the auxiliary assemblies, and, in case of bottle feed, of the weight of the tanks as well. The economy of the motor depends not only on the pressure but also on the nature of the working substances, since the heat effect of the reaction and the composition of the gases formed are strongly dependent on parent substances.

As is known, the specific fuel consumption of a liquid fuel rocket motor exceeds the specific consumption of turbojet engines 8-12 times. This is explained by the fact that the specific fuel consumption of a turbojet engine is determined only by the consumption of fuel from the aircraft tanks, whereas the air necessary for combustion (in the amount of 40-50 kg per 1 kg of fuel) is not taken into account, since it is extracted from the atmosphere. If, on the other hand, the specific consumption of a liquid fuel rocket motor is computed, not only the consumption of the fuel but that of the oxidizer as well is taken into account, since both are carried in the

tanks of the vehicle (aircraft, rocket).

We know that specific thrust is of great importance for the liquid fuel rocket motor. This value directly determines the dimensions of the motor, as well as the total amount of the required working substance, and — other conditions being equal — the volumes of the tanks. The dimensions of the tanks depend not only on the specific motor thrust and the duration of operation, but also on the weight density of the working substances. It is desirable that the substance have a great weight density in order to decrease the volume of the tanks.

If, instead of a single working substance, fuel and oxidizer are separately fed into the combustion chamber, the relative weight density of 1 kg of fuel and oxidizer mixture is determined for the purpose of comparison between different combinations

Table I
Specific Thrust of Some Modern Fuels and Oxidizers

Fuel \ Oxidizer	Nitric acid	80% nitric acid + 20% nitrogen tetroxide	Liquid ox.
kerosene	246	250	280
95% ethyl alcohol			270

Table II
Specific Thrust of Some Proposed Fuels and Oxidizers

Fuel \ Oxidizer	Liquid ox.	Liquid propellant mixture
kerosene		275—310
liquid hydrogen	350	385
liquid ammonia	280	330
hydrazine and dimethyl hydraz.	305	350
lithium	320	375
pentaborane	305	320
magnesium		320

of fuels and oxidizers from the standpoint of the required capacity of the tanks. To make the capacity of the tanks smaller, greater relative weight density of 1 kg of mixture is required. For instance, the relative weight density of fuel mixtures with liquid oxygen turns out to be 1.015 (kerosene) and about 1.0 (alcohol), whereas the relative weight density of a nitric acid and kerosene mixture is 1.32, i. e., greater by 30-32%. At the same time the specific thrust in the latter instance is 12% lower — given equal pressures in the chamber — than that for liquid oxygen and kerosene.

At the close of WW II and shortly thereafter specific thrust of liquid fuel rocket motors amounted to 170-190 kg sec/kg. The best characteristics were exhibited by a rocket motor which developed a specific thrust of 220 kg sec/kg, using liquid oxygen and 75% ethyl alcohol at a chamber pressure of 15.5 kg/cm².

At present, liquid fuel rocket motors develop a specific thrust of 240-250 kg sec/kg, because of the use of better fuel and oxidizer combinations, and also because of increased chamber pressures up to 40-50 kg/cm². Specific thrust could reach values of 300-350 kg sec/kg with promising fuels. The transition to increased spe-

cific thrust at equal comparison weight density of the mixture means an increase in motor thrust by 25% or, with unchanged thrust, a decrease in motor dimensions. This is accompanied by a 25% increase in the running time of the motor with the same tank capacity. The figures quoted show clearly the great importance of the problem of specific thrust increases in the liquid fuel motor.

Values of specific thrust at constant chamber pressures of some present and future fuel and oxidizer combinations for the purpose of illustration are shown in Tables I and II.

Other future combinations are possible as well (for instance ozone with kerosene or liquid hydrogen). The problem of utilization of materials in the atomic state (for instance H, N, and O) are of special interest, since they generate a great amount of heat in forming a molecule. However the difficulty is in finding effective means of storage of these materials in the atomic state. In addition the weight density of these materials (especially of H) is very small.

The design of the rocket is a rather important problem. After the required engine thrust, duration of the run, and the capacity required for fuel and oxidizer have been determined, the main problem amounts to minimizing the weight of the whole structure of the rocket, the motor and all equipment and control elements. This requires, in particular, determining the optimum thrust of a single motor and the means of supplying it with fuel. If M_{init} is the initial flight mass of a single stage (non-compound) rocket, and M_2 is the structural mass of the rocket (without fuel and oxidizer), the mass of the fuel and oxidizer contained in the rocket will obviously be $M_{init} - M_2$.

The velocity of the rocket at the moment of brennschluss can be computed by the well-known formula of K. E. Tsiolkovskiy, i. e., the velocity at the termination of the active flight leg is

$$V_{act} = W_{av} \ln \frac{M_{init}}{M_{term}}$$

where W_{av} is the average true velocity of gas flow from the nozzle during the active leg.

In computing the value of V_{act} by this formula, we assume that external resistance and the force of gravity are absent. Nevertheless the velocity V_{act} may be used to characterize the ideal efficiency characteristics of the rocket.

If nothing is consumed of the initial rocket mass in the process of the operation of the motor except fuel and oxidizer, the terminal mass will be $M_{term} = M_2$ at the end of the active leg. If, in addition, parts of the rocket are dropped as they become useless (motor, tanks, pumps, a part of the body, etc.), M_{term} will be less than M_2 .

Depending on the drop method, the mass M_{term} will, in a general situation, have a velocity greater than or equal to V_{act} . Limiting ourselves to a case when $M_{term} = M_2$ we designate the ratio of the initial and terminal mass (weights) of the rocket by

$$k = \frac{M_{init}}{M_{term}}$$

of the rocket by

$$\beta = \frac{M_{init} - M_{term}}{M_{init}}, \text{ or by } \beta = \frac{k - 1}{k}$$

Tsiolkovskiy's equation takes the form:

$$V_{act} = W_{av} \ln k, \\ \text{or } V_{act} = W_{av} \ln \frac{1}{1 - \beta}$$

The ratio k (or β) characterizes the ideal design efficiency of the rocket as a whole from the standpoint of the maximum obtainable theoretical velocity V_{act} for a given W_{av} .

The value of V_{act} determines the maximum (theoretical) kinetic energy $E_t = M_{term} \frac{V_{act}^2}{2}$ which would be obtained by the terminal mass of the rocket as a result of en-

gine operation if the rocket's mass were not subject to the force of terrestrial gravity and resistance of the medium. As is known, velocity (kinetic energy) can be transformed into altitude (potential energy) and vice versa. This is why the value of V_{act} plays an important part for the purpose of comparison.

If the work of the resistances acting over the trajectory of flight E_r is subtracted from E_t , the remainder E_a will represent the actual energy of the terminal rocket mass, a part of which, E_k , is expended in climbing, i. e., for the work against the force of gravity, and the rest, E_h , corresponds to the true kinetic energy $M_{term} \frac{V_a^2}{2}$ where V_a is actual velocity at the end of the active leg.

The value of E_r depends on the path, whereas the form of the trajectory does not affect the values E_t and E_h . This yields the important conclusion that $E_k = E_t - E_h - E_r$ depends on the path.

Consequently it is necessary to know the resistance of the medium at different altitudes and to determine the most advantageous flight trajectory of the rocket in order to decrease consumption of fuel and oxidizer required to reach the velocity V_a . It must be borne in mind that the mass of the rocket decreases markedly in flight; for instance, in one type of rocket the terminal mass is 3.7 times less than the initial mass, in another type of rocket it is 4 times less.

The terminal mass of the rocket must be given a velocity of $V_a = 7.9$ km/sec (the first cosmic velocity) in order to put an artificial satellite into an orbit within the bounds of the earth's atmosphere; then the satellite will move in a circular orbit. If this velocity is increased somewhat, the satellite will move in an elliptic orbit (as our Soviet satellites do). If the final mass of the rocket is given the speed of 11.2 km/sec (the second cosmic velocity), it will move out of the sphere of influence of the earth's gravity and will set out on a free flight in outer space on a parabolic, or (at a yet greater velocity) in a hyperbolic orbit.

In all of these cases the center of gravity of the earth is located at the center of the circle or at the foci of the ellipse, parabola or hyperbola. The orbit of the satellite will deviate from the above geometric lines under the influence of lunar and solar attraction and, at sufficient distances, under the action of other planets of our system.

It must be mentioned that potential energy and work against the forces of resistance are not large at cosmic flight velocities: the main quantity is the kinetic energy.

Let us compute the value of the energy E_k and E_h when establishing an artificial satellite in order to get an idea of the ratio between these two quantities for 1 kg at $V_a = 8$ km/sec at an altitude of $H = 1500$ km. The kinetic and potential energies will be equal to:

$$E_k = \frac{1}{2} \frac{v^2}{g} \approx 3.25 \cdot 10^6 \frac{\text{kgm}}{\text{kg}}$$

$$E_h = \frac{R_0 H}{R_0 + H} \approx 6.4 \cdot 10^6 \frac{1.5 \cdot 10^6}{6.4 \cdot 10^6 + 1.5 \cdot 10^6} = 1.22 \cdot 10^6 \frac{\text{kgm}}{\text{kg}}$$

Here R_0 is the radius of the earth ($\sim 6.4 \cdot 10^6$ m). The total energy accumulated will be:

$$E_k + E_h = 4.47 \cdot 10^6 \frac{\text{kgm}}{\text{kg}}$$

or 10,450 calories. Consequently the potential energy will form the following part of the kinetic energy:

$$\frac{E_h}{E_k} = \frac{1.22 \cdot 10^6}{3.25 \cdot 10^6} \cdot 100\% = 37.5\%$$

E_r will be even a smaller portion of this quantity.

By this example we have shown only the energy possessed by a one kg body raised to an altitude of 1500 km and traveling with the speed of 8 km/sec. For this purpose a considerable supply of fuel and oxidizer was required; the masses of the discarded parts of the rocket, also raised to the given altitude and given a certain (considerable) velocity at the expense of the fuel and oxidizer energy, had to be taken into account. The thermal efficiency of 1 kg of present-day widely-used mixtures is 1400 to 1800 cal/kg. A comparison of this quantity with the previous values of 10,450 cal (even without taking into account the expenditure of energy for lifting and accelerating discarded and used-up masses and losses due to the resistance of the medium) points to the necessity of building a multi-stage rocket with a large value of $k = \frac{M_{init}}{M_{term}}$

each stage. This was noticed by K. E. Tsiolkovskiy in his first work in 1903. According to approximate rough calculations, an initial weight equal to 1 ton is required for each kg of artificial satellite; this value includes the weight of the rocket body, engines, tanks, fuel, oxidizer, and all other equipment and controls; i. e., the value of k for the rocket as a whole is about 1000.

Fig. 3 shows a graph which exhibits the influence of W_{av} (specific thrust) and the weight fraction β of the fuel and oxidizer upon the theoretically obtainable speed at the end of the active flight leg (neglecting resistance and the force of gravity). In Fig. 4 is shown the influence of the weight fraction of the fuel and oxidizer for the speed $W_{av} = 2500$ m/sec (i. e. at an average specific thrust of 255 kg sec/kg), on the value of the velocity at the termination of the active leg. The graphs give a clear idea of how V_{act} can be increased if effective mixtures and the level of engine operation are properly chosen, and if the rocket as a whole and its separate elements are properly designed.

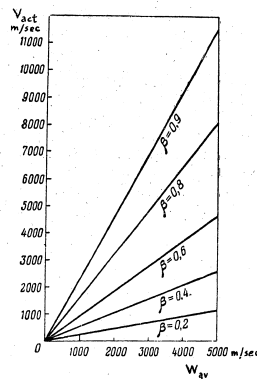


Fig. 3. Maximum theoretical velocity at the end of the active flight leg as a function of the average exhaust velocity of gases from the exhaust nozzle (for different values of β).

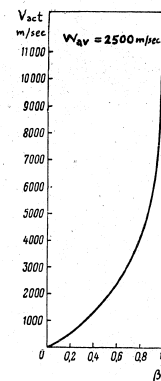


Fig. 4. Graph of the functional dependence of the maximum theoretical velocity at the end of the active flight leg as a function of the weight fraction of the fuel and oxidizer.

We see that the value of V_{act} at the velocity $W_{av} = 2500$ m/sec proves to be less than 6000 m/sec even at $\beta = 0.9$ (or at $k = 10$); i. e., with a single-stage rocket of such a type no artificial satellite can be launched. The successes achieved by Soviet rocket building indisputably prove the depth of the scientific engineering endeavor carried out by well-organized teams in creating economical and light-weight motors and in developing an efficient design for the rocket and its elements.

K. E. Tsiolkovskiy thought that space travel was possible only with the help of compound rockets with liquid fuel rocket motors. In a series of papers he considered the development of artificial earth satellites which could serve as intermediate stations for spaceships; he worked out the problems of living conditions on these stations and ships in the absence of gravity, the ways of insuring working conditions of people under these conditions, etc. These ideas met with mixed responses from his contemporaries but now they have been widely accepted. A great number of concrete proposals have been made, especially in recent years (Fig. 5).

The most daring forecasts of K. E. Tsiolkovskiy became reality, including his opinions about the era of space flights. Of course, a great number of complicated problems have yet to be solved (for instance radiation protection, the means of insuring reliable working conditions on the satellite, developing motors and economical fuels for them, insuring pressurization, safe return of the ships to earth, etc.). Set-

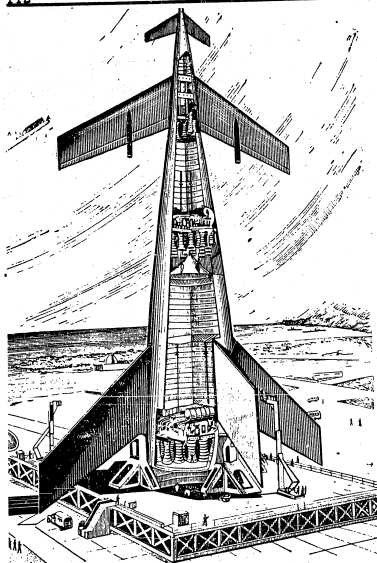


Fig. 5. A three-stage rocket design (proposed weight: 7000 tons).

ting up of the main base, not on a special artificial satellite, but on the moon, is not excluded. Such views have been expressed repeatedly, and the projects are under further development.

One of the serious problems, the solution of which is required for space travel, is the question of sources of energy. In conjunction with the use of the radiation energy of the sun, which is quite possible outside of the earth's atmosphere, the most promising is the utilization of intranuclear energy. Further studies and research must be carried out in this direction. Apparently the mastery of the process of controlled thermonuclear reaction will bring us closest to the solution of the problem of economical (from the standpoint of weight) energy sources.

In addition, trajectories for spaceships requiring minimum expenditure of energy for flight must be studied. Calculations of a flight to Mars bear witness to

the importance of this question. It must be remembered that the orbit of Mars is inclined 1.85° to the plane of the ecliptic. Transition from one orbit (earth) to another (Mars) must be effected along these elliptic trajectories which are tangent to both orbits (tangential transitional ellipses). Then the expenditure of energy will be minimal. But, of the infinite number of tangential transitional ellipses, only one ensures the least expenditure of energy.

In Fig. 6 are shown the values of the distances from the sun to the characteristic points of the orbits of the earth and Mars and the velocities of the planets.

Of the two rocket trajectories, one of which (A) leads to the orbit of Mars in aphelion, and the other (B) in perihelion, the least expenditure of energy will be in the case when the rocket approaches Mars in aphelion. The rocket in this case is launched from earth after the latter passes through aphelion, even though the earth's orbital velocity is here less than that in perihelion (29.26 km/sec).

At present we are on the threshold of the second cosmic velocity (11.2 km/sec) for escaping the field of earth's gravitation. It is possible that a rocket head will soon be sent to the moon or will orbit around it. With the appearance of artificial earth satellites and spaceships the possibilities will grow immeasurably for man to

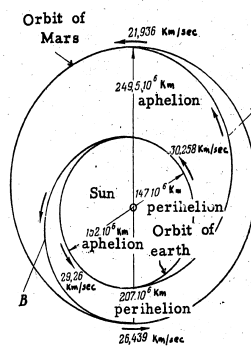
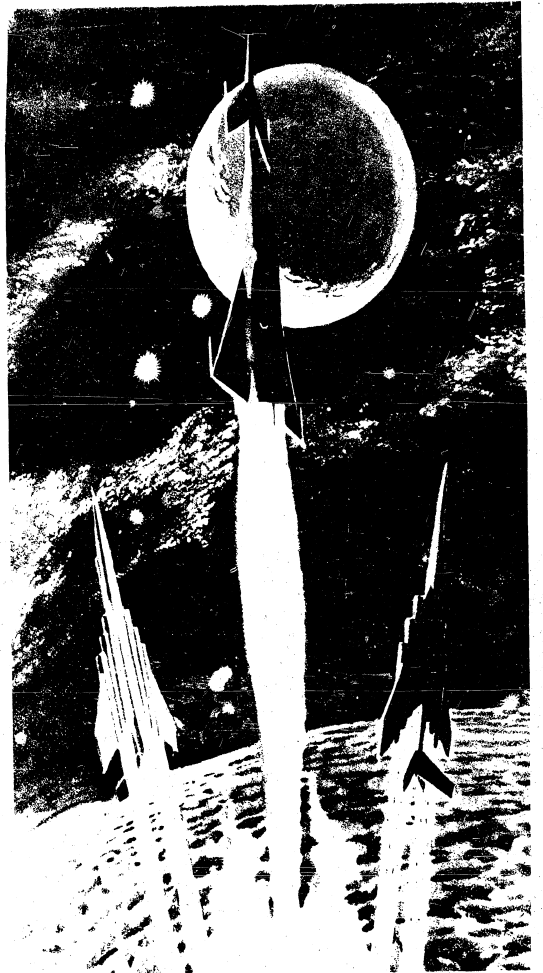
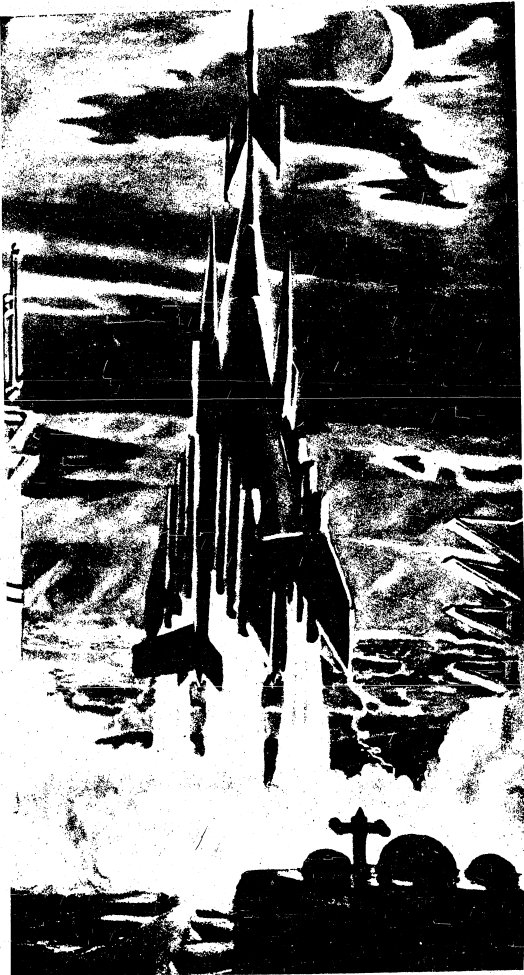


Fig. 6. Values of distances from the sun to the characteristic points of the orbits of earth and Mars.

know the universe which surrounds our planet. Not so long ago, man used his naked eye to study the sun, the moon, planets and stars. Our ancestors learned a great deal in this way. Subsequently with the aid of telescopes man found many stars, planets and their satellites invisible to the naked eye, which were recorded with the aid of still and moving picture photography. Spectral analysis has made it possible to determine elements in other celestial bodies. However this window into outer space has permitted us to see only a comparatively narrow spectrum of radiation with wavelengths of 2900 to 30,000 Ångströms (one Ångström equals 10^{-8} cm), while the human eye sees only light of wavelengths from 4000 to 7500 Ångströms. The narrow width of this optically visible spectrum is explained by the fact that terrestrial atmosphere does not let through waves of all lengths.

The atmosphere also lets through waves of from 1 cm to 35 - 45 m long; these waves have been studied only recently with the aid of radio telescopes. Having discovered a new radio window into space, man has widened the possibilities of learning about the universe.

Now, as we send artificial satellites (at first temporary ones, and later also permanent ones) we are going beyond the limits of the terrestrial atmosphere and are able to make a direct study of the surrounding universe.



WHEN YOU LOVE YOUR WORK

Senior Engineer Lt.
M. F. REBROV

After the scheduled briefing, the officers dispersed from headquarters. The young pilots, who were to fly tomorrow, hopefully looked for breaks in the dark and leaden sky. One of the last to leave was the unit engineer, Lt. Col. of the Technical Service P. A. Snimshchikov. It was freezing. The trampled snow crunched lightly underfoot. The officer walked and thought about a conversation with his commander — a suggestion to transfer to the duty of group engineer — critically evaluating his own service, his work, his past, and his present situation.

... It was the summer of 1939. The graduates of the air technical school were entering a new life. With ineffable joy Snimshchikov held in his hands a document directing him to go to one of the regiments for further service. His future position was outlined in three words: aircraft mechanic.

Many years had passed since then. Many hours, days, and sleepless nights had been spent at the airfield. Each year, each new plane that came to the unit was for him a step forward. What type of planes had Pavel Alekseyevich not serviced? Now, indeed, he could not even remember. The road to proficiency had been difficult. How much effort and will-power had been required before he acquired knowledge and experience!

The man who has devoted himself to aviation knows that this is not an easy course. Both grief and failure must be experienced. And only he who, without fear, surmounts obstacles and determinedly masters what is new will in the end be the victor.

Snimshchikov now recalled the first time he had serviced a machine for flight by himself. When the combat plane soared in the air, joy and emotion filled his entire being as he stood spellbound at the airfield, following with his eyes the fighter disappearing in the sky. The latter was long gone from view, but Snimshchikov still gazed upward, trying to find it in the limitless blue.

The servicing of a plane is a very responsible matter. And even those mechanics who have released aircraft hundreds of times always experience the well-known nervous tension. Indeed, in aviation, success in carrying out the assigned mission not infrequently depends on the efficiency and rapidity with which the plane is serviced.

At first, Snimshchikov enviously watched his older comrades, the confidence and aplomb in their movements, the dexterity with which they performed various operations. Watching their work, he tried to miss nothing, to remember and assimilate

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everything. The veterans willingly gave him of their experience and knowledge. But he had had scarcely three months of service in the unit when his peaceful working life was interrupted by the war with the White Finns.

For the young mechanic came the first real tests. During those months the entire regiment, from engine mechanic to commander, like a unified force, gave all its will, all its skill to the matter of victory. More than four thousand combat missions were flown; many glorious victories were won in the air. To make certain that the operations of the pilots would be successful, the engineers and technicians worked indefatigably. For exemplary execution of the command's assignments in the fight with the enemy, and for displaying valor and fortitude in doing so, the regiment was awarded the Order of the Red Banner.

... The last farewell turn over Lake Karkku-Lampi, and the planes headed southward. Enriched with combat experience, the regiment again took up its watch at an advanced air post on the western border and began to work resolutely for further improvement. Also increasing his proficiency was flight technician Snimshchikov.

The peaceful training was not to continue for long. On 22 June 1941 the pilots of the regiment were among the first to engage in aerial encounter with the Fascist invaders. On the morning of that very day they shot down three hostile aircraft. The combat debut had been made, and on its heels began the heavy drudgery of the front. For Pavel Alekseyevich the war was a severe combat school. Day and night the engines roared; day and night the planes flew out on missions to smite the treacherous enemy; day and night, without respite, the skillful hands of the technicians kept them in operation.

The tension at the front increased. The Soviet troops, overcoming enemy resistance, moved westward. Artillery shelling thundered without ceasing. Fighting bitterly for each meter of their native land were the foot soldiers, the artillery men, the tank men, the sappers. No less strenuous was the fighting in the air. The deadlines for releasing aircraft were constantly shortened, and there was more and more work. Combat work at the airfields went on unceasingly, not infrequently under a hurricane of enemy fire. The perturbation, the tension that had to be endured! The planes would go out on their missions, and the technicians would wait. The nearer the time for return, the greater the anxiety in their hearts. Toward the end, all patience was gone and they would go out on the flying field.

Everyone had the same thought, "How are they? Is everything all right?" Faces were frowning, concentrating. And suddenly some one would jump up and, flinging his arms high, would run toward a black, scarcely perceptible speck in the sky.

"They're coming, they're coming! Our boys are coming!"



P. A. Snimshchikov

And then a vague and distant hum could be heard. It would grow ever stronger and closer. One after another the planes would land. What their wings and fuselages had been transformed into! Some would have about a hundred holes from fragmentation and armor-piercing shells of varying caliber. There would also be jagged and gaping holes from direct hits by AA fire. One would look and marvel how tenacious of life the machine was, how it could withstand such a blow.

And again the mechanics and technicians would bustle about, striving with might and main to put the "wounded" machines back in working order. It was especially difficult at night in high winds and snow. The work area would be dimly lighted by only a pocket flashlight. The wind would get stronger and tear at the plane, banging the straps and buckles of the engine cover. The mechanics would scurry around the machines, yelling something to each other on the run. In spite of the bitter cold, throats would be parched, sweat would be dripping, and numbed hands would not hold the tools. The desire for sleep would be unbearable. But there could not even be any mention of that. The pilots were waiting, soon to go into battle again.

And when the Informbyuro [Information Bureau] laconically reported to the entire country that the fliers of X unit had hit the enemy another crushing blow, how much these few words meant to the technicians! Yet not infrequently their work and combat exploits, worthy of being enshrined in the memory of their descendants, seemed like ordinary episodes against the background of mass heroism.

Many of these heroes — Snimshchikov's comrades — did not live to see the joyous days of victory. And although some of their names are unknown, their memory is deathless.

... The war ended. In a relatively short period of time Soviet aviation surged far forward. The fabric-covered and wooden models became part of the distant past. Their place was taken by high-speed jet machines that fly at supersonic speeds. In servicing a plane for flight, in the technical maintenance of a plane during its operation, large numbers of specialists of different services now participate. Snimshchikov changed also. While yesterday he had been concerned only with his own small section, today, directing the air engineering service of the unit, he is called upon to solve major and multi-faceted problems. The difficult but rewarding work of an engineering leader requires a keen mind, persistence, profound knowledge, organizing ability, and the application of all mental and physical powers.

From the very first day of his work as unit engineer, he realized what a great responsibility had been laid on his shoulders. It was necessary not only to organize the maintenance of the planes, to keep them in constant combat readiness, but also to teach the flying personnel and the aircraft specialists how to operate the equipment properly. More than once doubts arose: "How could he handle all this? Could he, appointed to the post of unit engineer, contribute something new, add something to the knowledge of people who trusted him, get them to follow him, direct the efforts of each of them to exemplary execution of his duty?"

To do this without any higher education was quite difficult. It was necessary to study perseveringly. And although studying is not so easy at forty years of age, and although at times the multiplicity of duties made it impossible to find time for it, Snimshchikov completed refresher courses and systematically worked on his own.

His efforts were not wasted. With knowledge grew proficiency; confidence and maturity followed.

There are many ways of increasing the technical proficiency of aviators, but constant readiness and working order of a plane are achieved by systematic and appropriate care of every component, every assembly, every instrument, by carrying out all instructions and directions. Strict control, the execution of prescribed inspections at the proper time — this is one of the basic conditions for success in the fight against the causes of flying accidents. To these principal matters the engineer devoted his major attention.

His great practical experience helped in many ways to organize properly the work on piston-engine planes. But he found that even a well-worn path is not always easy.

The pilots of the regiment were among the first to retrain for jet equipment. Together with other specialists, Snimshchikov learned about the new machines at an aircraft plant where the aviators were told about the design and the special features of turbojet engines, were helped in understanding the construction and operation of all units and assemblies.

With great care Pavel Alekseyevich wrote down the new data in his workbook. The first flights began. And although Snimshchikov already knew many of the peculiarities of these planes, servicing them was a far-from-simple matter. The planes were carefully serviced; each engine was tested. But once in one training plane in the air the pilot reduced the throttle and the rpm declined and did not recover when the throttle was advanced.

After landing it was found that the regulator of the adjustable nozzle was not functioning, but why this was so was a mystery. They sought the reason for the malfunctioning everywhere. A mass of suggestions were put forward. Twice the engineer himself went up to test the machine; the regulator was replaced but without results. This was a difficult case of failure for Snimshchikov. They took the unit apart and only then did they find that the oil ducts of the regulator were clogged with bits of ceresin that had not been entirely removed when the engine was cleaned of its protective coating. And the result of this was that the nozzle did not retract when the throttle was moved.

The mechanics and technicians directly service a plane for flight; it depends on their work how the assemblies and equipment of the plane will function in the air. Snimshchikov watches his men; he knows their strong and weak points, their abilities and their aptitudes. At all the instruction periods and technical conferences, in group and individual conversations, the engineer reminds the specialists how important it is for the success of the work to be disciplined, collected. Not a single violation of discipline, order, or norms of operation by his subordinates does he let go without taking some action.

Snimshchikov thoughtfully analyzes every defect in aircraft equipment. Once in a post-flight inspection of a plane they found too much play in the flaps. They also checked the other machines and found the same defect in four of them. They began to look for the cause. It was found that the carriage bearings had broken down.

However, Snimshchikov was not satisfied with this. It was not enough to know that the bearings had broken down; the most important thing was to find out why this had happened. There could be two reasons: either it was a production defect, or the pilots were letting down the flaps at excessive speeds.

The next instruction period with the pilots he devoted to this subject. At the lesson, they discussed in detail the possible improper procedures of a crew in flight

and the consequences they would lead to.

The engineer tries in every way to maintain and develop initiative; he analyzes thoroughly the experience of the best specialists and disseminates it among his personnel. All this helps to instill a love for military equipment, to increase the number of outstanding men.

P. A. Snimshchikov never makes any hasty, thoughtless decisions. On a day when the aircraft were grounded, he was making an inspection of the planes. Beside one of them stood several technicians. They were arguing heatedly about the cause of a failure in the fuel system; according to the pilot, the engine would not maintain sufficient rpm at high altitudes. Having inspected the machine, the engineer suggested that the automatic fuel control should be replaced, but he did not hurry with conclusions until he had reviewed the appropriate literature.

"One cannot trust in conjectures and suggestions in our business," says Snimshchikov, "it is always necessary to be certain." And this is not an empty phrase, but a rule from which he never deviates.

In inspecting the planes, the engineer not only checks the condition of the equipment but also tests the knowledge of his subordinates. The majority of them perform their duties ably.

No less success has been achieved by Pavel Alekseyevich in training aviators. The level of technical training among the pilots of the regiment is high. Lessons are conducted regularly in classes that are well equipped with trainers, working models, display stands, installations, and other visual aids. The engineer's contribution in developing the training base has been substantial. However, as befits a Party man, he does not shut his eyes to errors and shortcomings.

"And, unfortunately, there still are some," he says. "Take for example the propaganda of technical knowledge among the flying personnel. Who, if not we, the engineers, is to do this work? But we still give lectures and reports on technical subjects all too infrequently, pleading the press of our work and lack of time."

It goes without saying that the engineering officer's day is fully occupied. He can be found on the apron, at the command post, at headquarters, in the barracks where the men rest, at the TECh [Technical Maintenance Unit] groups. As a rule, he participates in the pre-flight training of pilots. Here, useful counsel and well-qualified consultation can always be obtained from him. Snimshchikov is helped in many ways by officers of the aviation engineering service M. S. Kurguzov, S. F. Korneyev, A. A. Kupreyev, V. Ya. Fischelev, and others.

Formerly things had not been well in the regiment in respect to regulation inspections. The machines stood on the bare ground under the open sky. During fall rains the ground would become sodden, and mud would get into the cockpits and on the wing surfaces of the planes. Bad weather often hindered the work and the planes were held in regulation inspection for excessively long periods. The TECh have now been reorganized. But the airmen had much to do before a convenient work place was laid with steel plates.

In a high and roomy shed, the work now goes on at all seasons of the year. The hands of rationalizers have erected all kinds of facilities, display stands, and fixtures. They have also worked out their own strict procedures, permitting the entire production cycle to be carried out rapidly and efficiently. As soon as the scheduled aircraft

arrives at the TECh, on the basis of the deficiency report, the group chiefs draw up a plan giving the time and the procedure for performing the work. Before the working day begins, the specialists of the different services are assigned — on the basis of this plan — in such a manner that they do not hinder each other.

In the summer, when flying is intensive, there are times when several planes come in for inspection at the same time. Delay with any one of them may result in disruption of the flying schedule. The engineer knows this well. For timely execution of the regulation inspections and for rhythmic operation of the TECh, some of the planes are sent to the group five hours before the due date as determined from the number of flying hours.

... It is the central fueling station. This is a very busy place. Here planes are taxied to fill up with fuel, oxygen, compressed air. Here the planes are serviced for flying again. A whole complex of operations are performed simultaneously. Around the planes are engineers, technicians, mechanics. In many ways, maintenance of the flying schedule depends on how well these specialists do their work. That is why Snimshchikov spends much of his time here. With a feeling of deep satisfaction he now watches the work of the specialists who, working as rapidly and skillfully as they do in the daytime, inspect the machines and determine the smallest defects by distinctive signs. Men are working without any confusion, with concentration, and with efficiency. The warm winter uniforms make the figures look fantastic. The cold gets more intense. But hands that have become accustomed to the metal and the cold continue to service the military equipment. In a moment the planes will take off and depart into the murky and impenetrable darkness. The engineer follows each one of them with an attentive eye. It is not idle curiosity that moves him. By the way the machine takes off, by the rhythm of the engine, he assures himself once more that it is functioning properly.

In all matters, Pavel Alekseyevich always tries to find the most important thing. And most important for the regiment are improvement in the skill of the flying and engineering-technical personnel, strengthening of discipline, improving combat readiness. Tremendous determination, inexhaustible energy, and a Party attitude toward the work are necessary in order to perform these tasks. It is these that occupy the attention of the engineer as a leader and as a member of the Party Bureau. He helps the commander in every way to resolve these tasks, mobilizing to this end the efforts of the Communists and the Komsomol members, setting a personal example. Close contact with the men gives him strength, extends his field of action, helps him in an objective approach to the evaluation of events and phenomena. This, in essence, is his way of working; and it must be said that it is the correct way!

... Returning home now, Snimshchikov recalls year by year his service in the regiment. Nearly twenty years of his life have been spent here. Under the combat pennants of the regiment he has traveled thousands of kilometers through storms of battle, through peaceful days of training. Over these years he has become acquainted with and learned to love the men in the unit, its beautiful traditions. Everything here seems kindred, close, and amazingly familiar.

The engineer's thoughts again turned to the commander's proposal. But there was still time to think of that. He sighed and stepped out toward home still more quickly. Tomorrow is another flying day.

An Air Regiment the Same Age as the October Revolution

Remarkable is the history of the X fighter air regiment. This regiment grew out of a Red Guard air detachment that was formed immediately after the triumph of the October Socialist Revolution, and it is the same age as October.

The pilots of this Red Guard air detachment, later reorganized as the Second Fighter Air Battalion and then as a separate squadron, fought manfully against the White Guards on the Eastern, Tsaritsyn, Southern, and Southwestern fronts. The Red military pilots of the battalion, Ya. Ya. Gulyayev, N. N. Vasil'chenko, P. I. Pumpur, and others, distinguished themselves by their undying combat exploits. The names of these early heroes, as of those who came later during the defense of the Socialist Fatherland from the Fascist invaders, are the pride of our Air Force and of the entire Soviet people.

On 7 May 1922 the air fighter squadron took the oath. It was received by the Chairman of the All-Russian Central Executive Committee M. I. Kalinin.

On 1 May 1924 for its high ratings in training the squadron was granted the right to participate in the air review over Red Square. For the first time in the Moscow sky the pilots of this renowned Air Force outfit wrote with a formation of their planes a name dear and close to the hearts of every Soviet individual — "Lenin".

In respect to combat training, this squadron was first among all Air Force outfits. And when in May 1925 the Union of Transport Workers presented to the Third All-Union Congress of Soviets a squadron of combat planes that they had acquired with their own savings, the planes were given to this, the oldest Air Force outfit.

The regiment's road from the Civil War to the Patriotic War was the road of tremendous growth in the men and equipment of our Air Force, in their combat and flying skill.

The Great Patriotic War found this Air Force unit in the Baltic area. Here, on the very first day of the war, Capt. Dolzhenko opened the unit's combat account. On 22 June 1941 he flew six combat missions and shot down four enemy planes. In a single battle on the far approaches to Leningrad, Hero of the Soviet Union Senior Lt. P. T. Tarasov destroyed three Fascist aircraft. Fighting under the difficult conditions of besieged Leningrad, the personnel of this unit displayed heroism and daring. For example, Senior Lt. Dmitriyev shot down 17 "Heinkels" at the very walls of the citadel of the Revolution.

Love for their Motherland and devotion to the great cause of Communism have always inspired these aviators to heroic feats and have made them in-



Conversation in the regiment's glory room

vincible.

The pilots of the unit fought at Stalingrad, in the Northern Caucasus and the Ukraine, in Belorussia and Lithuania; they participated in the battles for Warsaw, and Poznan', on the Oder, in Pomerania, and in the Berlin operation of the Soviet Army.

The regiment distinguished itself particularly in battles for mastery of the city and the tactically important railroad junction of Orsha. On 27 July 1944, by a decree of the Presidium of the Supreme Soviet of the USSR, the regiment was decorated for exemplary execution of command assignments in battles against the Fascist invaders in the capture of the city of Vil'nyus and for displaying valor and bravery in this engagement.

During the Great Patriotic War, the pilots of this regiment took an active part in working out new tactical methods: free-lance patrol, clearing the field of battle, dispatching special volunteers, control of an air battle by radio. They skillfully protected ground assault planes and bombers in battle, reliably covered ground troops, efficiently made reconnaissance.

The last figure in the score of enemy planes shot down was added by Capt. A. I. Odnoblyudov, who is even now serving with the unit, training young men in flying skill. This happened in the Berlin skies, where the 580th enemy plane was destroyed.

The regiment has nurtured 16 Heroes of the Soviet Union. Under its glorious banner have served Twice Heroes of the Soviet Union B. F. Safonov and S. P. Suprun. And pilots P. I. Pumpur, I. K. Spatarel', and others have become generals.

The oldest Air Force unit — this fighter regiment — now is among the first in political and combat training. Over the past few years its flying personnel have mastered a new type of domestically-produced aircraft and are now flying remarkable supersonic jet fighters. Examples of their proficiency have been displayed by Heroes of the Soviet Union N. S. Konyshov and A. I. Trud, by pilots Kozlov, Odnoblyudov, Papshev, and many others.

Under the leadership of tested pilots, outstanding young men — daring, bold, and devoted to their Motherland — are being educated in the heroic traditions of the regiment.

On the 40th anniversary of the regiment, a telegram arrived, addressed to the commander. It said:

"I express the hope that the personnel of the regiment will continue in the future to guard sacredly and to multiply its glorious battle traditions.
[signed] Minister of Defense of the USSR, Marshal of the Soviet Union R. Malinovsky."

The Supreme Commander of the Air Force congratulated the aviators on this momentous anniversary. Numerous congratulations came from Party, Komsomol, and public organizations, as well as from groups of workers in plants and factories.

Capt. V. S. Vukolov.