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30 November 1984

# USSR Report

## MILITARY AFFAIRS

## AVIATION AND COSMONAUTICS

No. 8, August 1984



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Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal AVIATSIYA I KOSMONAVTIKA published in Moscow.

## CONTENTS

KUTAKHOV ON USSR AVIATION DAY

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 1-3

[Article by Hero of the Soviet Union Chief Mar Avn P. Kutakhov, commander in chief of the Air Forces, deputy minister of defense USSR: "Guarding the Peaceful Skies"]

[Text] USSR Aviation Day is being celebrated this year in an atmosphere of great political and labor enthusiasm on the part of the Soviet people, who are filled with determination to implement the historic decisions of the 26th CPSU Congress and the subsequent CPSU Central Committee plenums. Enormous mobilizing influence on sociopolitical affairs in this country has been exerted by the February and April (1984) party Central Committee plenums, the first session of the USSR Supreme Soviet, 11th Convocation, and speeches by CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet.

Under the guidance of the Communist Party the Soviet people, through selfless labor, are improving and perfecting our developed socialist society, are increasing our country's wealth, and are strengthening its economic and defense might.

National income has risen, material and spiritual living standards of Soviet citizens have increased, and there has been a substantial growth in real per capita income in the years which have passed since the 26th CPSU Congress. The Food and Energy Programs and the targets of the 11th Five-Year Plan are being successfully implemented. The political system of the Soviet society is also improving. The alliance of workers, peasants and intelligentsia and the fraternal friendship among the peoples of the USSR are growing stronger. Socialist democracy is developing and deepening, and participation by the toilers in governing the affairs of the state and society is expanding. Implementation of reform of the general-curriculum and vocational school will help speed up the economic and social advance of our society.

The CPSU Central Committee attaches great importance to preparing an updated version of the party Program, which will specify large and difficult tasks

pertaining to improving developed socialism, a precisely defined long-term strategy for accomplishing them, and will define the linkage between our current affairs and the Communist future.

The valiant USSR Armed Forces constitute a powerful and reliable shield protecting the homeland, a faithful guard watching over the building of communism, and a bulwark of world peace. Our glorious Air Forces, the fighting chronicle of which began together with the birth of the world's first socialist state, also stand firmly in the united ranks of the armed defenders of the Soviet Nation Their establishment and development are inseparably bound with the name of Vladimir Il'ich Lenin.

During the difficult years of civil war and foreign military intervention, Red military pilots successfully pounded the enemy. History honors and preserves the names of the winged defenders of the homeland who, together with the entire Red Army, defended our revolutionary achievements.

Thanks to constant concern on the part of the Communist Party, a mighty aircraft industry was established during the years of the first five-year plans, talented scientists and designers were developed, flight and technician personnel were trained. Within an unprecedentedly short time the Soviet Union became one of the world's leading aviation powers. Following the patriotic appeal to fly higher, faster and further than all others, in the prewar years Soviet pilots flying Soviet-built aircraft made a number of outstanding flights and established more than one third of the world aviation records.

An incalculable contribution to the development of aviation was made by Lenin Komsomol, which in January 1931 adopted a resolution to accept patronage status over the Air Forces. Intrepid young people, indoctrinated in a spirit of total dedication to communist ideals and faithfulness to the party and people, entered aviation.

The growing power of Soviet military aviation and the excellent moral-political and fighting qualities of our pilots were graphically demonstrated in combat against the Japanese militarists at Lake Khasan and on the Khalkhin-Gol River. Soviet volunteer fliers, carrying out their internationalist duty, fought bravely in the skies over Spain and China.

The Great Patriotic War of the Soviet Union against the shock forces of international imperialism -- Hitlerite Germany -- was a stern test of our people and its Armed Forces. When the clarion call rang out in 1941: "Arise, vast country, stand to mortal combat...," aviators, just as all Soviet military personnel, stood to the defense of the beloved homeland, displaying a high degree of fighting skill, unprecedented staunchness and courage.

The Air Forces -- the most highly-mobile and long-ranging branch of the Armed Forces -- greatly influenced the course and outcome not only of individual operations but of the war as a whole. From the very first hours of the war our combat fliers, faithful to the ideals of Leninism and totally dedicated to the Communist Party and Soviet people, fearlessly joined battle with the aggressor, giving their energies and very life for the sake of defeating him. Their exploits and their names will serve for many generations to come as an

inspiring example of boundless love for the homeland, unprecedented staunchness and courage in battle. Soviet aviators destroyed 1,284 enemy aircraft in the first three weeks of the war alone.

In the battles of Moscow and Stalingrad, the Caucasus, the Kuban, and Kursk, a determined struggle was fought for strategic air supremacy. In the summer of 1943 Soviet fliers gained total air supremacy and firmly held it right up to the total defeat of Hitlerite Germany.

Soviet military aviation transitioned fully over to more sophisticated aircraft. They became a genuine instrument of victory in the hands of the combat pilots. Our homeland's winged heroes were credited with 57,000 of the 77,000 enemy aircraft destroyed on the Soviet-German front during the war years. Naval fliers also made a large contribution toward achieving victory, alongside Air Forces and air defense aviators. They were credited with two thirds of all enemy ships sunk and damaged. Civil aviation also made a substantial contribution to victory. More than 20,000 civil aviation pilots were reassigned to the Air Forces and took part in combat.

The homeland highly valued the exploits of our winged defenders. More than 200,000 aviators were awarded medals and decorations, 2,420 were named Hero of the Soviet Union, 65 were twice awarded this title, while famed combat pilots presently Mar Avn A. Pokryshkin and Col Gen Avn I. Kozhedub were three times awarded the title Hero of the Soviet Union. Sixty-five percent of aviation combined units and units were awarded medals and decorations, while many were given honorary designations and awarded the guards appellation.

The Leninist Communist Party was the organizer and inspirational force behind the selfless struggle by the Soviet people against the German-fascist invaders and the genuine author of the Great Victory. Under exceptionally difficult conditions it ensured a unity of political, economic and military-strategic leadership and united the battlefront and home front into a single mighty fist. Its finest personnel were to be found at the most dangerous and critical points of battle. Soviet aviators, just as the men of the other branches of the Armed Forces, considered it the highest honor to march into battle as Communists. By war's end the number of party members in the Air Forces had more than tripled.

The victory over fascist Germany and its allies, states the CPSU Central Committee decree entitled "On the 40th Anniversary of Victory by the Soviet People in the Great Patriotic War of 1941-1945," is of world-historic significance. It confirmed that there are no forces in the world capable of crushing socialism or halting its advance. Wise leadership by the Communist Party, the advantages of the Soviet societal and governmental system, the ideological and sociopolitical unity of our society and all the peoples of the USSR, Soviet patriotism and proletarian internationalism, and mass heroism by Soviet citizens on the battlefront and on the home front constituted the decisive factors in our victory.

The harsh lessons of history and the inglorious end of German fascism and Japanese militarism taught nothing to the fanciers of military adventures. The complex, tense situation which has developed in recent years through the

fault of rash adventuristic actions by the aggressive forces of imperialism is not improving. It remains highly dangerous. And this is due to the fact that the present U.S. Administration continues to count on military force, gaining military superiority, and forcing its policies on other peoples. The United States is pushing on a priority basis implementation of more and more new programs for the development and deployment of nuclear weapons, which threaten the existence of mankind. Deployment of U.S. nuclear missiles in Western Europe is also continuing, which presents a particular threat to peace.

The present aggressive, militaristic course of policy by reactionary ruling circles in the United States and other NATO countries is aimed primarily against socialism. The U.S. imperialists view the USSR and the other nations of the socialist community as the principal obstacle in the path of achieving their pretensions to world domination.

But the forces of imperialism and war are opposed today by the mighty and continuously growing forces of peace. These include first and foremost the mighty Soviet Union, the nations of the socialist community, the liberated countries of Asia, Africa, and Latin America, and all other forces opposing the imperialist policy of escalation of the danger of war.

The Soviet Union is a reliable bulwark of peace. It and the other Warsaw Pact member nations place in opposition to the militarist course of policy of the United States and NATO a broad program of specific peace initiatives directed toward normalizing the situation in Europe and throughout the world. Appraising the present international situation, CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, noted in his address at the Armed Forces Conference of Komsomol Organization Secretaries: "In the world arena we must also deal with political forces to which good will is alien and which are deaf to the arguments of reason. Here too an indispensable role is played by the deterrent power of our defense potential. It is today not only a guarantor of the productive labor of the Soviet people but also a guarantor of world peace." This places on our Armed Forces, including military aviation, an enormous responsibility for reliable defense of the homeland and the achievements of socialism.

During the postwar years the Air Forces have risen to a qualitatively higher level and constitute a formidable branch of the Armed Forces. Today they are equipped with the most modern aircraft and weapons.

Carrying out the demands of the CPSU Central Committee and USSR minister of defense, in recent years military aviation personnel have taken a substantial stride forward in boosting combat readiness and improving the level of air, weapons, operational and tactical proficiency. At exercises our commanders, staff officers, political workers, and the majority of personnel have demonstrated increased combat maturity and excellent moral-political and psychological qualities. Aviation units and combined units have learned to work in more efficient coordination with the other branches of the Armed Forces and to employ modern aircraft systems with a high degree of effectiveness. The forms and methods of training and preparation for the conduct of operations and engagements are constantly being improved.

Considerable attention is devoted to perfecting modes of combat actions in conditions of enemy employment of highly-accurate combat systems, modern means of reconnaissance and electronic warfare, and automated command and control systems.

Today the sons and grandsons of the war veterans are vigilantly guarding the peaceful skies of the homeland. They are ever alert, prepared at all times, together with their comrades in arms -- the fighting men of the brother socialist countries -- to carry out their patriotic and internationalist duty with honor. They measure their performance against the exploits of Heroes of the Soviet Union G. Yeliseyev, V. Gaynutdinov, Ye. Zel'nyakov, V. Kot, I. Zhukov, V. Pavlov, V. Shcherbakov and others, who displayed courage in military labor, in mastering new equipment and weapons, and in carrying out the tasks assigned by party and government.

The realities of life are continuously presenting us with new and more difficult tasks. Accomplishment of these tasks presupposes integrity, persistence, and concentration of all efforts of command-political personnel, party and Komsomol organizations. The military-political situation and the tasks assigned the Air Forces by the CPSU Central Committee and USSR minister of defense demand of personnel a high degree of mobilization, increased responsibility for combat readiness, and a high level of air and combat proficiency in conditions maximally approximating actual combat.

Achievement of a high degree of combat readiness on the part of Air Forces units and subunits remains task number one, the main criterion for effectiveness of the work being done by commanders and political workers, party and Komsomol organizations. Revealing the nature and substance of combat readiness, USSR Minister of Defense MSU D. F. Ustinov, member of the CPSU Central Committee Politburo, stressed that it is determined first and foremost by the quality of personnel field, air and sea proficiency, by the degree of their mastery of weapons and combat equipment, by level of moral-political conditioning, troop discipline and organization, and by art and skill of troop command and control. Everything in this most important activity should be subordinated to unconditional and high-quality execution of combat and political training schedules, with strict observance of the requirements of guideline documents, the rules and procedures of flight service, and flight safety regulations.

Today as never before leader cadres should organize work with an eye to the future, possess a sense of the new, a heightened understanding of their personal responsibility for exemplary performance of their military duty and for the success of the fighting outfit as a whole, and should rely on party activists and the support of all Communists and Komsomol members.

Personnel of aviation units and subunits are faced with important tasks pertaining to further mastery of highly complex modern aircraft systems and their combat employment. In order to gain victory with certitude in today's combat and to operate according to the principle "Every missile, bomb, and rocket into the target!", it is essential to be an advanced-rating specialist, an expert in aerial combat or combat employment, and an expert marksman. But to achieve this it is necessary first and foremost to possess a solid

foundation in theory, thorough knowledge of the equipment, aerodynamics, and tactics. And one should always bear in mind that these subjects, which are extremely important to the military pilot, are continuously evolving, especially in recent years, and require regular upgrading and reinforcement of knowledge. Here also a great deal depends on organization of ground training, its orderly manner, purposefulness, and effectiveness. Just as in the entire combat training process, important in this area are a rigorous methodological consistency, a scientific approach, and a logical interlinkage with the phases of flight training.

The summer period is characterized by intensive flight activities. On routine training flights and at tactical air exercises military aviators work persistently to improve their combat skills and master the science of winning.

Great importance today is being assumed by the campaign for efficient utilization of training time, especially flying time. And wherever the training process is well organized on the ground and in the air, where orderly military routine has been established and the requirements of documents governing flight activities are rigorously implemented, combat and political training results are high.

Concern with improving air proficiency should be combined with concern with flight safety. In spite of the fact that even in daily routine training crews perform highly complex flight assignments day and night, in varying weather and tactical environments, we have many units and subunits operating without mishap. Nevertheless there still are deficiencies in this important area. Therefore those persons who organize flight operations, who take part in them and provide support to flight operations must take particularly vigorous and effective steps to prevent air mishaps and near-mishap situations.

Firm military discipline is a guarantee of fruitful training. Without it there can be no combat readiness, and victory in actual combat is inconceivable. In conformity with the demands of the party, the campaign for further strengthening discipline must be filled with specific content. In conditions of the military this means instilling firm observance of regulations, ensuring precise organization of performance of job-related duties, and ensuring by all measures of persuasion and strict demandingness conscientious performance of duties by aviation personnel.

The quality of performance of combat training tasks and the level of troop combat readiness depend to a decisive degree on people's ideological maturity and the moral-political climate in military collectives. Therefore commanders and political workers, party and Komsomol organizations should constantly concern themselves with political conditioning of aviation personnel, forming a Marxist-Leninist ideological outlook and unity of conviction and action in personnel, as well as indoctrination of total dedication to the Communist Party and our socialist homeland and class hatred toward imperialism. It is necessary to improve across the board the quality of Marxist-Leninist training of officers, political instruction of warrant officers, political classes with NCOs and enlisted personnel, ideological and political indoctrination work. In order to develop in party members and all Air Forces personnel a thorough understanding of Leninist party theory and policy as well as today's demands

of the party, there should be extensive utilization of political instruction in all forms, agitation and dissemination of the decisions of the 26th CPSU Congress, the February and April (1984) party Central Committee plenums, the points and conclusions formulated in speeches by CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, and the proceedings of the 6th Armed Forces Conference of Primary Party Organization Secretaries and the 5th Armed Forces Conference of Komsomol Organization Secretaries.

A tried and tested means of mobilizing military personnel for intensive study and development of their creative initiative is socialist competition, which is being conducted this year under the slogan "Be alert, constantly ready to defend the achievements of socialism!" The military collectives led by officers Yu. Temnikov, V. Dobrynin, A. Tsalko, A. Derbenev, V. Murashkin, B. Belokon', L. Shanin, L. Badin and others have achieved substantial performance results in socialist competition.

The military labor of aviation personnel is duly appreciated by the Communist Party and Soviet Government. Many vanguard commanders, political workers, pilots, navigators, engineers, technicians, communications and rear services specialists have been decorated. The finest officers and general officers have been awarded the prestigious titles "Honored Military Pilot USSR" and "Honored Military Navigator USSR."

Our Leninist party, the Soviet people and the men of the Armed Forces are entering the period of immediate preparations for the 27th CPSU Congress. This places on all AIr Forces personnel even greater responsibility for complete and high-quality execution of all combat and political training programs and schedules. "In order to hold the aggressive U.S. forces in check and reliably to ensure the security of the homeland and our friends," states USSR Minister of Defense MSU D. F. Ustinov, member of the CPSU Central Committee Politburo, "all of us, each one at his work station and duty station, must work conscientiously and responsibly, carrying out his patriotic duty with honor."

Honoring Aviation Day with additional military accomplishments, Air Forces personnel, faithful to their patriotic and internationalist duty and closely united behind the CPSU, will continue in the future together with all Soviet servicemen, in a fighting alliance with the allied military forces of the Warsaw Pact member nations, vigilantly and reliably standing guard over socialism and peace.



3024
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GUNSHIP PILOTS URGED TO BE PREPARED FOR EN-ROUTE RETARGETING

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) p 4

[Article, published under the heading "Be Alert, In a Continuous State of Combat Readiness," by Capt A. Zhilin: "When the Mission Is Changed"]

[Text] Capt V. Reykh's section was assigned the mission of hitting an "aggressor" company strongpoint. During the period of immediate preparation, the pilots laid out and carefully computed a route of flight which ensured undetected approach to the target, and selected distinctive terrain features for initiation of the attack run. The section commander then tested his men's knowledge of the mission and made necessary comments. After "walking through" the sortie, he checked readiness.

The helicopter section took to the air on schedule. Conditions were difficult, and therefore the aircraft commanders -- Capts A. Bagrov, A. Osipov, and Sr Lt S. Belokonev -- were careful to maintain strict formation. The team was fated, however, not to carry out the mission according to the "scenario" worked out in advance. They were advised by radio that the situation on the battlefield had changed abruptly, and therefore the group was reassigned to a different mission.

The section commander quickly analyzed the current situation and instructed his copilot-weapons operator over the intercom to figure a course to and arrival time at a new target. Soon Lt V. Shagarov had the figures ready.

"This is 500. Turn left.... Heading...." the leader radioed.

Some time later the helicopter section suddenly appeared over the range. Executing an antiair-evasive maneuver, the pilots destroyed the designated targets with accurate fire.

What was it that ensured the aircrews' successful accomplishment of the mission in spite of the more complicated battlefield situation? I believe it was first and foremost thorough preparation on the ground. The aviators did not limit themselves to working out only the principal attack variation but, conjecturing various situations, discussed the procedure of action to follow if for one reason or another changes occurred. By analyzing the possible

tactical environment they were also preparing themselves psychologically for a difficult job.

The experience of tactical air exercises indicates that there still occur instances when crews do not respond efficiently when retargeted en route. I shall cite an example.

Officer V. Belyakov's men handled an assigned mission well. But the commander was not particularly pleased with the performance, and here is why. According to the preliminary plan, his group was to attack "aggressor" tank reserves. In order not to give themselves away in advance, it was decided to maintain radio silence en route to the target. The plan worked. But it would seem that it was successful only because the aircrews were given no scenario changes. The mission, as they say, was flown without interference. And if the command post had found it necessary to retarget the group, the radio silence most probably would have been broken by transmission of mission clarifications and extraneous queries. The fact is that in preparing for the mission Sr Lt N. Lipin and Lt N. Lipatov and A. Pleskach worked up a single mission variation, forgetting that in today's fast-paced combat the situation can change at any moment, requiring a new tactical solution. In the case in question the pilots were counting on ideal conditions.

Here is another example. In a certain subunit S. Slavov had taken off on a sortie to wipe out an "aggressor" airborne assault force. While en route, however, the pilot's mission was changed. He had to expeditiously strike tanks which had broken through the "battle line." Slavov immediately changed heading for the designated area. But he did not fully accomplish the mission.

Analyzing this sortie, the squadron commander determined several factors for the partial mission failure. First of all, the route of approach to the target was incorrectly selected, and the helicopter was spotted by "aggressor" air defense. Secondly, when delivering fire on the tanks, the pilot was unable effectively to utilize his combat stores. And thirdly, he incorrectly determined the main target: instead of the lead tank in the column, he attacked tanks in the middle of the column. Naturally the sortie proved little effective.

Experience indicates that when flying any mission a pilot should always be prepared for unexpected situation changes and en-route retargeting. This determines in large measure the success of combat training. Close teamwork and cooperation between air and ground troops is possible only if the combat pilots have the ability to respond swiftly and competently to any situation on the battlefield. He who counts on a sortie working out according to the "scenario" frequently fails on the battlefield. This is well understood in the squadron commanded by Military Pilot 1st Class Maj D. Vasilevskiy. The aviators in this subunit are constantly learning. At the initiative of the squadron commander, organization of training here has been somewhat altered. The helicopter pilots do not limit themselves to studying only flying-related matters. Keeping pace with the times, they are clearly aware that one can achieve substantial success in military endeavors only if one is well familiar with the mechanisms of ground combat. In brief drills and exercises they analyze in detail questions pertaining to ground troops tactics. This

squadron's pilots never wait to be prompted from the ground; they have the ability to analyze the situation on the battlefield and successfully apply their knowledge in a practical manner.

Unfortunately training has not been set up so effectively in all subunits, but not always through the fault of the aviators. Some commanders of ground units, to put it mildly, respond unenthusiastically to pilot suggestions to hold joint training activities. They rarely visit the squadrons and make no effort to learn the finer points of helicopter crew actions over the battlefield. I believe that such an approach to teamwork and cooperation is unwarranted, and the common cause of the aviators and motorized riflemen suffers as a result.



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U.S. 'STAR WARS' WEAPON DEVELOPMENT REVIEWED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 10-11

[Article, published under the heading "The Pentagon's Orbital Arsenal," by Candidate of Technical Sciences Col E. Buynovskiy and L. Tkachev: "'Star' Weapons"; based on materials published in the foreign press]

[Text] Recently the world press has been devoting much attention to matters connected with resolving a key problem of the present day: whether or not any kind of weapon should be in space. The fact is that the efforts of the U.S. military-industrial complex are directed toward embodiment of their arms programs in specific systems and complexes, space-based laser and electron-beam weapons and antisatellite systems. Although these weapons and systems, which are of great destructive force, are still in the early stages of conceptualization or are at various stages of development and testing, the time when these death-dealing weapons could be launched into space is not too far off, especially if one considers that the Reagan Administration is appropriating billions of dollars each year on their development.

Alongside the development of space weapons, the United States is formulating a "star wars" strategy and setting up organizational and technical entities. According to a statement by Western strategists, military activities in space in the process of its "industrialization" will be conducted chiefly in the interests of accomplishing the following missions: ABM and antisatellite defense, destruction of ground targets, air traffic control in space, command-control, communications, intelligence and meteorological support for the various armed services and national command authority, as well as marine and air navigation support, position area survey and fire delivery support for ground forces. Naturally each of these tasks will require specific scientific and technical solutions, systems and equipment, orbital assemblages, spacecraft and launch vehicles.

The question of a U.S. strategy of warfare in space was discussed at the April meeting of the NATO nuclear planning group. Seeking to brainwash its aggressive-bloc allies, the United States demanded, using the standard pretext of a "Soviet military threat," that they "contribute to the development of combat laser technology" for deployment of laser weapons in space.

Seeking to prevent space from being turned into a springboard of aggression and war, the Soviet Union once again confirms that it is ready and willing to apply maximum efforts to ensure that the sinister plans to move the arms race into space do not become reality. This idea is emphasized in the response by CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, to an appeal by U.S. scientists: "Urgent steps are needed before the ominous process of militarization of space becomes irreversible. There should be no place here for propaganda tricks and attempts to secure various temporary advantages for oneself. The problem of preventing the militarization of space is a problem of importance to all mankind. It demands radical solutions. Such solutions are fully attainable It is necessary to be aware of the entirety of one's responsibility to peoples and to display a determination to reach an agreement."

At the request of our readers, the editors have prepared a series of articles which will examine U.S. military-designation space hardware, both on the drawing boards and already existing.

At one time it was being stated in the Western press that he who conquers space will rule the world. Work on development of space weapons commenced in the United States precisely at that time, slightly more than 20 years ago.

On Johnston Atoll the United States deployed a system of active means, including fixed-site ground launchers, and radars to measure trajectory and guide various versions of the Thor booster. This system, which provided the capability to intercept space vehicles at altitudes up to 640 km, became operational in 1964.

At the same time work was in progress on a second, more sophisticated program -- Spartan. Its interceptors boasted increased range and accuracy of guidance. But Pentagon spokesmen claimed that the antisatellite weapon was incapable of doing the job (in particular, they considered its slow response time to be one of its main drawbacks) and insisted that it be further improved. And they got their way.

In 1977 the U.S. Air Force signed a contract with Boeing to develop the ASAT antisatellite system. Some of its specifications were reported in the press in the United States and a number of West European countries. It will include a Command Center with attendant radar facilities for target detection and interceptor guidance to the target, as well as two squadrons of F-15 aircraft carrying a two-stage solid-propellant rocket and antisatellite weapon. The

rocket (see diagram) is about 5.5 meters long and up to 50 cm in diameter. The first stage is a SRAM booster, designed for an air-to-air missile system. The second stage is an Altair-3 solid-propellant rocket motor, which is also used as the fourth stage of the Scout booster.

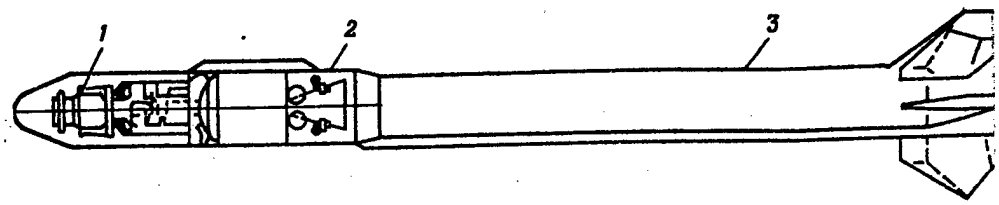


Diagram of rocket with antisatellite weapon

Key: 1. Homing warhead; 2. Altair-3 solid-propellant rocket motor; 3. SRAM booster

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The antisatellite weapon is based on a ramming-type warhead, which contains an optical homing system and a miniature onboard digital computer, around which are placed the thrusters which control warhead movement on computer command during the homing phase. Upon approaching the target, the thrusters separate from the warhead and serve as additional contact fragments. A command center for U.S. Air Force antisatellite operations is under construction in Colorado.

This program's first flight test took place in January. An F-15 fighter launched a rocket carrying an antisatellite weapon, which was to reach a specified area in space. Twelve flight tests of the system are to be conducted in 1984-1986, during which it is planned to destroy targets consisting of an inflatable device carrying instrumentation and boosted into orbit on a Scout rocket. If the tests are successful the system will go on an operational readiness status in 1987.

It is initially planned to equip 28 F-15 aircraft and to establish a ready inventory of 56 boosters with ASAT warheads. The number of F-15 fighters equipped for antisatellite warfare may be increased at a later date. It is also planned to use the Trident C-4 missile as a booster-interceptor.

Today the Pentagon seems to have forgotten that about 10 years ago it was urging adoption of the ASAT. Seeking approval of the new weapon, the Department of Defense is stressing the shortcomings of the previous design, which were known to the experts as far back as 20 years ago.

The fact is that interception of a target in space, both from a ground launcher and from an aircraft at any given moment, the experts claim, is virtually impossible for technical reasons, for the interceptor's point of departure, together with the earth, is independent of the target's orbital motion. This leads to a misalignment of orbits. As a result, if the latitude at the interceptor's point of departure is greater than the orbital

inclination of the target, target intercept from the guidance phase is impossible. If it is less, it is feasible to launch the interceptor only at two times every 24 hours, under the condition that its launcher is in the target's orbital plane. In the general case a technically very difficult problem must be solved in order to expand the interceptor launch time frame: the interceptor must be provided with a virtually unlimited fuel supply. In addition, its control system, ground flight support services, and mathematical package of launch and intercept trajectory algorithms must be sufficiently flexible and accurate. At an altitude up to 500 km, for example, an interceptor weighing 1 ton must burn 400 kg of fuel to turn its orbital plane just 10 degrees. A control system error of one one hundredth of a second can result in a 100 meter error at target. The same applies to the software. The accuracy with which the computer solves the intercept problem depends to a large degree on level of knowledge of geophysical constants, the earth's atmosphere, target intercept aerodynamics, and actual realization depends on the capabilities of the onboard and ground equipment.

These difficulties of course did not daunt the Pentagon strategists or the White House administration when they focused the principal efforts of all the mass media at their disposal on justifying the development of a new, large-scale antimissile defense system even before commencing testing of the ASAT system. More hypocritical, pseudopeaceseeking statements are being made on this one issue at the present time than on any other. These include concern about the "defenseless" U.S. population, the "humane nature" of the new weapon, maintaining "legality," as well as claims that this is virtually the way to bring an end to nuclear weapons altogether. But it is difficult to deceive people today. Regardless of the "dovelike" cooing used by the militarist flock of U.S. "hawks" to conceal their true aims, one thing is clear: their leader, President Reagan, has set course toward building a road to destruction of our planet.

The large-scale three-tiered antimissile defense system, the "peaceful" purpose of which is so loudly touted in the United States, is being developed primarily for the purpose of providing a shield under the protection of which it will be possible to brandish a nuclear club without fearing retaliation. Thus the Reagan Administration is concerned not with defense but with acquiring nuclear first-strike capability which can be used with impunity, and attainment of military superiority. This is the inexorable logic of current development of military hardware and the strategy of its employment in the United States.

In 1972 the USSR and the United States entered into a treaty limiting ABM systems. With this they in principle agreed to restrain the arms race across the board. And now the current White House Administration is attempting to undermine a ratified and non-expiring treaty, for it reins in the Pentagon's militarist ambitions and hinders growth in the profits of the U.S. billionaires.

In January 1984 Reagan signed a directive calling for commencement of an expanded scientific research program to determine the possibilities of deployment of new weapons in space. It is planned to spend 2 billion dollars in fiscal year 1985, and more than 20 billion dollars in the succeeding five

years, primarily on development of various methods of destroying missiles, including laser weapons and "particle-beam cannons," which would fire powerful beams of directed energy.

High-energy lasers are still in the initial development stages, but the Pentagon is already making far-reaching plans for their utilization, particularly since this fervor is being encouraged by officials at various levels. Recently, for example, R. Cooper, director of DARPA, testified at a congressional hearing that in the last year the United States has made two technological breakthroughs. The first was the development of a high-energy laser, and the second a system of compensation for atmospheric distortions for ground communications with space vehicles, which will ensure laser beam passage through the atmosphere without distortions.

The principal role in an antimissile system disposed in depth, which is the most attractive to vested-interest U.S. business circles and is being touted by the mass media, is assigned to the space-deployed forward echelon. There is no shortage of schemes for utilizing space hardware for these purposes. And all of them are aimed at solving a single problem, which consists of several subproblems: target search, acquisition and tracking regardless of speed and maneuver capability, focusing a laser beam to damage (destroy) the warhead, missile body or its most vulnerable component. It is planned to hit the target ICBM in the boost phase of flight, within a span of several seconds. Development of precisely such devices, however, presents the greatest difficulty at the present time.

The United States is presently engaged in an extensive effort, involving several parallel programs, to develop laser technology and the separate components of a space-based laser weapon system. From a technical standpoint the greatest difficulties lie in developing high-energy laser units with a pulse power of up to 30 kJ, beam aiming and control systems. Development of target selection and tracking devices has been in progress for quite some time. But here as well, judging by reports in the foreign press, a great deal of work remains to be done, since increased demands are imposed on these devices: capability to lock on and initiate tracking within 1-5 seconds, and beam stabilization with an accuracy of 0.05-0.1 microradian. This will require development of systems which can detect an ICBM, predict its movement, and provide target designation within the first 50 seconds in flight, and accomplish fast reaiming of satellite-mirrors.

Juggling figures, experts argue the advantages of their own design and the feasibility of developing a laser weapon in the very near future. But U.S. Government officials should become clearly aware that the USSR will not permit itself to be inferior in this area. "June 1941 shall not be repeated. Immediate retaliation awaits any aggressor. Let all know this -- both our friends and our adversaries," noted CPSU Central Committee General Secretary K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, in a speech at a get-together with the workers at Moscow's Hammer and Sickle Metallurgical Plant.

The possibility of developing and the prospects of using weapons based on elementary-particle accelerators are widely discussed in the foreign press.

The principle of such weapons is based on the fact that a charged particle takes on extremely high energy under the effect of applied electric potential. It is also possible to generate beams of neutral particles. Three principal areas of utilization of weapons of this kind are projected: destruction of ICBMs and satellites beyond the atmosphere; protection of individual targets (ships, for example) against cruise missiles; protection of missile launch silos against ICBM warheads.

The principle of employment of beam weapons (just as high-energy lasers) involves the following operations: target detection, discriminating it against a background of jamming, guidance to the target and, when necessary, tracking, release of energy in the direction of the target, determination of target hit, estimate of target damage and, in case of a miss, determination of magnitude and direction, refinement of aim (reaiming), and release of a second energy pulse. The cycle then repeats.

Capability of fast system reaiming is considered to be an advantage of beam weapons, for aiming a beam of charged particles at a new target is accomplished by a corresponding change in intensity of the fields of the control electromagnets, which can be accomplished practically instantaneously.

As is reported in the foreign press, a beam weapon system should contain a charged-particle accelerator, a power source and devices to store energy, and target detection and guidance equipment. A team of specialists at MIT calculated that a beam weapon installed on a satellite and designed to hit ICBMs beyond the atmosphere should have energy in the beam in the order of 200 Mev, require a 1-10 amp power supply, have a pulse duration of 0.1 second and a pulse repetition frequency as high as several hertz.

The present level of scientific and technological advance is at present insufficient to offer specific ways and methods of solving the problems connected with developing a space-based beam weapon. At the present time this is considered to be achievable in the distant future. Nevertheless Pentagon strategists are closely monitoring the progress of scientific and experimental research in this field.



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BOOSTING PARTY INFLUENCE AT KHARKOV AIR FORCES ENGINEERING SCHOOL

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 12-13

[Article, published under the heading "A Higher Level of Party Influence at Air Forces Higher Educational Institutions," by Col N. Pimenov: "Utilize Reserve Potential More Fully"]

[Text] The editors have received responses to an article by Col Gen Avn L. Batekhin, military council member and chief of the Air Forces Political Directorate, entitled "Boosting Effectiveness of Party Influence at Air Forces Higher Educational Institutions" (AVIATSIYA I KOSMONAVTIKA, No 3, 1984), in which the author formulates current tasks and states critical comments. The authors of the responses -- leader-Communists, party activists at service academies and schools -- tell of the work which has been accomplished, directed toward further strengthening the role and influence of party collectives on all aspects of life and activities of training subunits and on how the quality and effectiveness of the training and indoctrination process are growing.

In the following article Col N. Pimenov, senior instructor in the department of Marxism-Leninism at the Kharkov Red-Banner Higher Military Aviation Engineering School, tells of the work experience of the school's command personnel, political workers and faculty members, and examines questions pertaining to further increasing the party-mindedness of teaching and strengthening the ideological and moral indoctrination of future military aviation engineers.

An all-out increase in the breadth of political knowledgeability of young officers and cadets and development in them of qualities essential to the ideological warriors of the Leninist Party is a logical process, dictated by practical realities, by the complexity and conflictive nature of the present international situation and by aggravation of the ideological confrontation between two opposing social systems.

Experience persuasively confirms that it is precisely the level of party, genuinely scientific guidance of the entire training and indoctrination process at higher educational institutions which primarily determines success in training command, political, and engineer-technician cadres who are totally dedicated to the cause of communism. It is therefore not surprising that the political workers and instructors in the department of Marxism-Leninism perceived as a mandate the following statement by the military council member and chief of the Air Forces Political Directorate: in the interests of enhancing the ideological directional thrust of the training and indoctrination process, it is essential to strengthen the role of the social sciences departments and their influence on ensuring party-mindedness of teaching military and specialized subjects.

This question is of particular significance to us. The fact is that our military higher educational institution is relatively young. Nevertheless the administration, political section and party organizations have done a great deal of organizational-methodological work, including in the area of improving the system of teaching all subjects offered at our school. Particular attention was focused on drawing up recommendation to strengthen the ideological thrust and party-mindedness of teaching not only general scientific but also military as well as specialized subjects.

Extension lectures for the young instructor and commander have been organized under the auspices of our school's methodological center. With the active assistance of social sciences instructors, the school's political section and methods council have drawn up appropriate recommendations for all departments, aimed at increasing the party-mindedness of teaching every academic subject, as well as insert sheets on each topic and for each specific class session. They recommend what is most advisable to utilize for purposes of indoctrinating students in a spirit of Marxism-Leninism, Soviet patriotism and socialist internationalism, a love of aircraft, and how to ensure an organic interlinkage between topics being discussed and party policy, the practical building of communism, increasing vigilance and combat readiness.

The department of Marxism-Leninism greatly assists instructors in the military and specialized subjects. The department's officers review introductory lectures, teaching methods aids, attend classes given by young colleagues and help them in a practical manner.

The political section, jointly with the department of Marxism-Leninism, has put out two guides with methodological recommendations on party-mindedness of instruction. A new teaching methods guide is presently being readied for publication; it will reflect not only the essence of the principle of Communist party-mindedness of instruction but also ways to achieve its most effective implementation in the teaching and indoctrination process.

Questions pertaining to improving work in the area of further adoption of the principle of party-mindedness of instruction are regularly discussed at party buro meetings and departmental party meetings. Scientific methods conferences are held just prior to the beginning of each new academic year, with the participation of leading scholars and experienced teachers and methods specialists at service academies and related Air Forces higher educational

institutions In our opinion these conferences constitute a school of exchange of experience and know-how in working to improve the training and indoctrination process. A fairly good job has also been done by interdepartmental seminars and joint meetings held under the direction of the political section by the department of Marxism-Leninism together with the general science departments. At these meetings personnel analyze deeply and in detail the state of work directed toward increasing the party-mindedness of teaching in these departments, articulate more specific ways to improve it, plan practical assistance by social sciences instructors, and examine the most important ideological and methodological problems. Finally, questions pertaining to improving party-mindedness of teaching and strengthening the ideological thrust in all indoctrination work are regularly discussed by the school council.

In short, these matters constantly occupy the center of attention of the administration and political section, the party organizations of the faculties and departments, which view ensuring a high degree of party-mindedness of instruction as a matter of vital concern and seek to ensure that all Communist faculty members thoroughly understand the party's requirements regarding training and indoctrination of aviation engineer cadres and forming in them a feeling of responsibility for their own ideological and professional growth.

The party organizations of the departments extensively follow the practice of presentation of reports by party members on how they are utilizing in the process of teaching specialized subjects the proceedings of the 26th CPSU Congress and subsequent CPSU Central Committee plenums, and how they are achieving their personal targets pertaining to ideological-theoretical improvement, improving their teaching skills, and ideological content of teaching. As a rule party activists are the initiators of synthesis and dissemination of the advanced know-how of the finest teachers and methods specialists.

A great many military educators, genuine experts at their job, have developed at our school. They include officers V. Kudrinskiy, A. Kruglikov, V. Samoray, A. Chechin, A. Goncharov, L. Fadeyev, Yu. Suslov, and others. They always prepare thoroughly and comprehensively for every class and conduct them on a high scholarly and professional level. Stated in more precise terms, as they are teaching, these officers skillfully indoctrinate their students, injecting ideological-moral content into every class session.

CPSU Central Committee General Secretary Comrade K. U. Chernenko noted at the special February (1984) CPSU Central Committee Plenum that one must have the ability not only to formulate correct goals but also to work persistently to attain them, overcoming all difficulties. One must realistically appraise the attained level, not exaggerating but also not understating it. We also approach evaluation of our work realistically and objectively. Comprehensive examinations of the faculties and departments conducted by the administration, political section and curricular section, class visitation, and analysis of the state of discipline and training of the future officers indicate that we have not yet achieved the requisite effectiveness in ideological thrust of the entire training and indoctrination process.

In our view the main reason is that not all instructors have as yet become permeated with the highest sense of responsibility for the quality of lecture classes, their profound ideological content and party-mindedness. As a result some party members are not utilizing professionally and methodologically rich teaching aids and recommendations in full measure, and sometimes sporadically. Some people even doubt the need for a given formulation or recommendation on party-mindedness of teaching, believing that the main thing is the practical aspect of the matter.

Yes, we agree that the specialist's specific job training is the main thing, but not the only thing. Experience indicates that regardless of a young officer's professional-area training, without an adequate moral-political foundation, a thorough understanding of his party and professional duty and responsibility for the assigned task it is sometimes difficult for him correctly to use his knowledge and skills and to find his proper place in the line unit.

As we know, the process of forming a Communist ideological outlook in a person can be considered effective only if the points of revolutionary theory become points of reference for his practical activities, when his words do not diverge from his deeds, and their unity becomes a daily standard of conduct. This is what a positive experiential posture is.

At the present time, however, not every officer cadet takes such a position. Instances of violation of military discipline, a negligent attitude toward one's job and studies, and deviations from standards of Communist ethics are noted in training subunits. And we also sometimes hear unflattering comments about graduates from the line units. In this connection we must share the concern of the author of the article "Boosting Effectiveness of Party Influence at Air Forces Higher Educational Institutions" regarding the fact that some young officers -- yesterday's graduates of higher educational institutions -- show such negative traits as lack of discipline, negligence in performance of job-related duties, dishonesty, and ill-mannered behavior toward one's comrades.

In view of this fact, our commanders, political workers, and faculty are firmly convinced that party-mindedness of teaching cannot be limited just to the classroom. The principle of Communist party-mindedness should also be extensively applied in the teaching and indoctrination process and outside the classroom as well. This year the administration and political section set up operations by three groups of extension lectures on ideological-moral and aesthetic indoctrination of officer cadets: "Soviet Military Etiquette," "The Theater and the Modern Day," and "Music and the Modern Day." The lectures are presented by faculty members and students from the Kharkov Institute of the Arts and faculty from our school's department of Marxism-Leninism. Several lectures have been held to date. As is indicated by responses by officer cadets and their superiors, they have aroused lively interest on the part of the future engineers. Similar classes have been planned for the immediate future and beyond. Activists are seeking to improve the lecture offerings taking the students' needs and interests into account.

Intensifying the party and ideological thrust of instruction and improving the effectiveness of the entire training and indoctrination process, commanders, political workers, and the entire faculty at the Kharkov Higher Military Aviation Engineering School seek to achieve the main thing: to equip the officer cadets -- future Air Forces engineers -- with a genuinely scientific ideology and solid professional knowledge and skills, and to develop in them firm Communist conviction and the positive experiential posture of the Soviet citizen and armed defender of the socialist homeland.



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MAKING KOMSOMOL COMMITTEE ACTIVITIES MORE EFFECTIVE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 14-15

[Article, published under the heading "Implementing the Recommendations of the Armed Forces Conference of Komsomol Organization Secretaries," by Capt N. Chebotarev: "Confirming Authority With Deeds"]

[Text] Flight operations were in full swing when Komsomol committee secretary Lt V. Demin appeared at the field. He hurried past a group of young pilots who were engaged in animated conversation, walked past the flight line, and stopped for a moment by the runup pad, where combat aircraft were waiting for their takeoff clearance. Encountering All-Union Komsomol committee member Lt I. Yerokhin, he handed him operational news sheets, which had been prepared in advance, a pile of newspapers, and hurriedly jotted down the names of the Komsomol members who had distinguished themselves during the preflight preparations. Soon the Komsomol leader, back at the now empty headquarters, proceeded to prepare his address at a forthcoming committee meeting, where they were to discuss in detail how aviator-Komsomol members participate in ensuring flight safety and how they are mastering related occupational specialties and skills of aircraft maintenance and operation on the ground and in the air.

Let us return to the airfield, however. Many of the men had distinguished themselves during the flight operations. Young maintenance specialist Lt V. Markov, for example, had readied his aircraft for operation with excellent quality, and during the periods of free time had explained to mechanics Pvts S. Ryzhov and Kh. Mamedov how to do a better job of performing a given operation. Lt O. D'yakov succeeded in preventing a near-mishap situation. The command authorities cited the best aviation personnel. To the chagrin of the activists, however, few people walked over to take a look at the posted newssheets and bulletins. What was the problem? The fact is that the visual agitation materials contained neither the names of the aviation personnel who had distinguished themselves during the flight operations nor illustrated advanced know-how. Posted on the boards were only socialist pledges for the flight operations shift and brief notices about those personnel who had done a good job working on the aircraft during preflight preparations. But what about the training sorties themselves, for the sake of which all the preceding measures had been taken? Personnel and Lieutenant Demin himself did not find

out about how Komsomol members had performed during flight operations until the following day, during the performance summaries.

Let us examine the work style of this Komsomol leader. Is he helping make all work more effective, and is he promoting a strengthening of the prestige and authority of the activists, and in particular the secretary himself? Of course not! Demin's brief visits to the airfield, to the barracks, to the Lenin rooms of the subunits, and his fleeting encounters with the activists evoked in the young aviation personnel a feeling of bitterness and dissatisfaction with the work of the Komsomol committee, and have engendered passivity and a disinclination to take part in civic affairs.

At the next committee meeting Lieutenant Demin did say the right things as usual. He invoked the demands of the guideline documents which govern accident-free flight operations and backed them up with appropriate facts and figures. Nevertheless no effect was produced. On the contrary, the statements by many members of All-Union Komsomol contained fairly sharp criticism directed toward the Komsomol secretary for serious errors of omission in his work with youth and his inability correctly to rely on the Komsomol activists and guide them.

The work style of each individual activist is unquestionably individual and specifi- There is, however, a common element characteristic of all those who lead youth. "The Komsomol work style," it was noted at the 19th All-Union Komsomol Congress, "should be permeated with businesslike efficiency, specificity, a scientific approach, and a high degree of demandingness, tolerating no manifestations of smugness and complacency, excessive attention to form with detriment to content, and swagger." This idea figured prominently in all speeches at the 5th Armed Forces Conference of Komsomol Organization Secretaries.

Precisely such a style characterizes many Komsomol activists, including officers S. Skachek, S. Rybalko, and A. Milekhin. I recall the following incident. Once at a meeting of Komsomol workers Captain Skachek was asked to report on his experience in working with alert-duty flight Komsomol activists. Although his presentation was not scheduled in advance, Sergey was pleased to take the floor. And few people knew that he had flown to the meeting with hardly the time to put the bare essentials in his briefcase, grabbing pen and notebook. On the day prior to his departure, this Komsomol activist had been working with his comrades late into the evening, preparing visual agitation materials in the alert-duty flight shack, after which they had discussed the matter of how to ensure that each and every young aviator becomes thoroughly familiar with the performance characteristics of the aircraft of the potential adversary, their approach range to detection by radar, plus other specialized matters. They drew up a detailed plan-scenario for holding a technical quiz and military-type relay competition among Komsomol members coming on alert duty.

Captain Skachek also told about this at the meeting, as well as problems which are being resolved by the Komsomol committee, seeking to ensure personal exemplariness on the part of each and every member of All-Union Komsomol in an alert-duty flight. And although he spoke unprepared, impromptu, he was able

to spark the audience's interest and presented his comrades with an example of innovative search. It is not surprising that following his presentation there occurred a lively debate on the forms of Komsomol influence on young aviation personnel standing alert duty.

Here is another example. The Komsomol members in the aviation unit in which officer S. Rybalko serves had met their socialist pledges ahead of schedule pertaining to devising and adopting efficiency innovation suggestions. But Rybalko is not one to rest on his laurels. At one of the Komsomol meetings a justified comment was made that the innovation potential of the young officers -- engineers and technicians -- in efficiency innovation work was far from being fully utilized, due to the lack of adequate facilities and insufficient utilization of diversified forms of moral and material incentive. There were also other statements, but the Komsomol worker decided to respond personally to this critical comment, considering it to be more important. He held a special Komsomol committee meeting with the participation of the members of the invention and efficiency innovation commission, and reported activist suggestions and proposals to the commanding officer. And things improved: efficiency innovators were assigned special work areas, were assisted with materials, and Komsomol activists sought to provide moral encouragement to the innovators.

At Rybalko's initiative, they began to hold ceremonies honoring the best efficiency innovators in the unit, as well as technical innovation review-competitions, and issues of attractively formatted news bulletins and honor sheets were dedicated to innovators. Results soon began to show up. Within a short period of time the number of efficiency innovation suggestions increased. Capt K. Marchenkov, for example, suggested six innovations. Sr Lts G. Shadan and B. Durnov made three efficiency innovation proposals each. And officers R. Gubaydulin and A. Lekomtsev devised a set of equipment making it possible to cut almost in half the time required to check aircraft equipment in field conditions.

Businesslike efficiency, demandingness, and the ability promptly to see the most important, determining factors -- these qualities are absolutely essential to Komsomol leaders. And practical experience convincingly confirms this fact. The occupational specialty learned at service school by Sr Lt I. Milekhin, for example, differed from those of the Komsomol members of the unit in which he was elected member of the All-Union Komsomol committee. At that time they said to him: why should a Komsomol activist be familiar with the finer points and regulations pertaining to radar operation and maintenance? This, they said, is the business of the professionals, who are responsible for quality of communications and radar support services for flight operations. Aleksandr did not share their opinion. He maintained that one can earn genuine acknowledgment and respect by Komsomol members only through personal example in one's work, and profound competence in the area of work performed by one's fellow personnel. And he endeavored to spend as much time as possible with the men working the equipment, watching, asking, not ashamed to ask for advice and assistance, and in the evenings, when he had a few free moments, he would patiently and persistently study technical manuals and diagrams, and charts. Finally Milekhin felt that his knowledge of the equipment was up to par with the finest specialists. Can you imagine the joy

of this youth activist when during the final performance evaluation the Komsomol members displayed a high degree of professional knowledge, fully met their socialist pledges, and the higher-ups set him as an example as a signal officer.

Indeed, a Komsomol activist can gain the respect and acknowledgment of young people only when they see that his words are not louder than his deeds, when work on self-improvement becomes an internal need.

I believe that there is also reserve potential here for the activities of the party organizations, which exercise daily oversight over Komsomol. For example, what is the secret of the lively organizing and innovation effort by the Komsomol committees of which officers Skachek, Rybalko, and Milekhin are members? The answer is simple: the Komsomol leaders work hand in hand with party activists, adopting everything of value and progressive from their wealth of practical experience in aviator indoctrination. The party organizations in turn constantly keep a finger on the pulse of the affairs of the collectives, guide their activities, and impose tough demands on young Communists elected to Komsomol administrative bodies.

It is not mere chance that we have addressed the subject of the work style of Air Forces Komsomol leaders. As was emphasized at the recent 5th Armed Forces Conference of Komsomol organization secretaries, this issue is assuming paramount significance in present-day conditions. There is every assurance that the conference proceedings and recommendations will help us successfully accomplish the task at hand.

Our motto is: work, study, and live in the Leninist manner.



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IMPORTANCE OF REVOLUTION IN SCIENCE, TECHNOLOGY IN EAST-WEST CONTEST

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 18-19

[Article, published under the heading "At the Fronts of the Ideological Struggle," by Candidate of Philosophical Sciences Lt Col A. Pozdnyakov: "Scientific and Technological Revolution and the Battle of Ideas"]

[Text] CPSU Central Committee General Secretary Comrade K. U. Chernenko stressed at the special February (1984) CPSU Central Committee Plenum that building a new world means tirelessly concerning oneself with forming the man of this new world and with his ideological-moral growth. This most important task is being carried out in conditions of sharply stepped-up ideological attacks by imperialism.

Scientific and technological advance is playing an increasing role in the intense struggle between two ideologies, a struggle which is truly global in scale and significance. Scientific and technological advance has led, in particular, to a revolution in development of the mass information media and has substantially expanded capabilities of international exchange of information. The apologists of imperialism are attempting to exploit precisely this development.

There is occurring in our time swift growth in the capabilities of such effective technical means of ideological struggle as television, radio, motion pictures, published materials, and duplicating equipment. According to U.S. figures, approximately 1,500 books of various titles, with anticommunist content, are published each year in the United States. Pentagon propaganda agencies are responsible for more than 250 of these 1,500. In addition, the U.S. Department of Defense operates 204 radio stations and 80 TV studios on every continent. Genuine information-propaganda intervention is being waged with the aid of this technology. The concentration of modern means of mass information in the hands of the monopolists is increasing year by year, and corporations engaged in military-industry business are increasingly becoming the owners of the media.

Thus the swift growth in the capabilities of the mass information media under the influence of achievements of the STR [scientific and technological revolution] is being exploited by imperialism for the purpose of aggravating

the ideological struggle against the USSR and the other nations of the socialist community. The significance of these media is steadily growing in turn in connection with the general rise in the cultural and literacy level of the masses. This has led to a situation where the battlefront of the ideological contest between capitalism and socialism, as was noted at the June (1983) CPSU Central Committee Plenum, today runs through the consciousness of virtually every person on this planet.

The scientific and technological revolution has changed not only the character but also the content of the ideological struggle. Attempting to find explanations for the swift processes of scientific and technological advance which are convenient from the standpoint of capitalism, bourgeois ideologists deliberately falsify and distort them.

Absolutization of science and technology and the productive forces of society and ignoring of production relations are common to bourgeois social thinking pertaining to the STR. There are many different opinions on this score. In particular, some bourgeois ideologists assign the principal role in societal affairs to science and scientists. Others consider technology to be the principal domain of man's activity, and engineers and technical experts to be society's elite. Still others absolutize the significance of the domain of management, and correspondingly that of managers and administrators.

Nevertheless the principal theme of bourgeois literature dealing with the STR today is the future of mankind. Naturally the apologists of capitalism do not assign a place to communism in this future. At the same time bourgeois ideologists cannot ignore socialism and its vast accomplishments, including in the area of scientific and technological advance, just as, incidentally, they cannot ignore the defects and growing contradictions of imperialism.

A great many different models of the future society are created. One of them is a projected "information society as a postindustrial society." In the opinion of bourgeois philosophers, this will be a "nation of universal flourishing of man's intellectual creativity in place of overabundant material consumption." The logic of evolution of technology and the creation of an information society, which are independent of people's wishes, allegedly are leading toward it. A vanguard, "revolutionary" role is assigned to computers in this process.

The advocates of "postindustrialism" hope that the STR will make it possible to eliminate the economic, sociopolitical and other conflicts of imperialism and build an "ideal" societal model. They argue that capitalism and socialism allegedly move closer together as they advance toward a "postindustrial society," that is, their convergence (mutual penetration) takes place. To substantiate this notion they cite facts of common development of science and technology under capitalism and socialism, strengthening of economic and cultural ties between them, etc.

The class significance of the idea of convergence is obvious -- to turn aside the class aspirations of the proletariat and to create in the toilers an illusion of the uselessness of revolutionary reforms, since the STR itself will allegedly, independent of the class struggle, lead the world to a common

societal system. But a closer examination reveals that this vaunted "postindustrial society" is nothing other than a slightly modernized capitalism, since its fundamental principles (private ownership and, consequently, man's ruthless exploitation by man) remain intact, and encroachments on them are viewed as a threat to freedom of the individual.

In their vain attempts to halt the spread of Marxism-Leninism, bourgeois ideologists resort to every falsification. They have advanced the theory of "the end of ideology" ("deideology"). Since ideology, as we know, is an expression of the interests, goals, and ideals of specific classes, in the opinion of the bourgeois falsifiers a class vested interest, bias, and therefore... lack of objectivity are inherent in any ideolog" And since this is so, they loudly claim, it must be replaced by impartial, purely technical calculations and formulas. If one more closely examines the arguments of the apologists of capitalism, one can clearly see the hypocrisy, since their notion is per se exceptionally ideological: while predicting the demise of ideology, they are dreaming chiefly about the demise of Marxism-Leninism.

These hopes are in vain. In his report at the June (1983) CPSU Central Committee Plenum and in subsequent speeches, CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, strongly reemphasized that the scientific nature and party-mindedness of Communist ideology organically complement one another, since the root interests and goals of the toilers of the socialist society and its vanguard, the Communist Party, are not in conflict with the objective course of history but proceed from it. Communists more than anybody else are committed to a correct understanding of the law governing societal development and conformity between their practical activities and these laws.

Communist ideology is attracting the minds and hearts of millions with its truth, honesty, purposefulness, integrity, and optimism. Naturally the hired scribblers of imperialism cannot admit this. They have proceeded to explain the spread of Marxism-Leninism as caused exclusively by the aggressiveness of Communist propaganda. Therefore their appraisal of ideology has changed. While not giving up their arguments about the unscientific nature of ideology, particularly Communist ideology, the apologists of capitalism have recently began talking about its great social force. This has resulted in the birth of the notion of "reideologization," that is, active, aggressive dissemination of bourgeois ideas and "values." This notion has become politically embodied in Reagan's announcement of a "crusade" against socialism, in adoption by Washington of the notorious "program of democracy and public diplomacy," and in the creation of an "antisocialist international" (alliance of the most reactionary parties in Western Europe), etc.

Recently bourgeois ideologists have also stepped up their attacks on one of the principal revolutionary forces of the contemporary era -- the worker class. In their opinion it has allegedly lost its revolutionary nature under the influence of the scientific and technological revolution, while the role of vanguard societal force is shifting to the intelligentsia, particularly the scientific-technical intelligentsia. Here too our ideological adversaries attempt to distort the true meaning of the era of the STR.
PA.

Indeed, the percentage share of workers of intellectual labor and the number of scientists and engineers is rising, and fairly rapidly, in the industrially developed countries, regardless of their sociopolitical system, as a result of the scientific and technological revolution. Of course the number of toilers employed in physical labor is diminishing. But this does not refute, as the apologists of capitalism attempt to claim but, on the contrary, confirms the ingenious forecast made by K. Marx, who maintained that the industrial worker was the man of the future. As practical experience indicates, scientific and technological advance is increasing the numbers, organization, cohesiveness, and Communist ideology of the worker class. The struggle by the workers of the capitalist countries for social advance is expanding. Current realities are demonstrating this, for example, by the fact that it is becoming increasingly clear day by day: imperialism is incapable of coping with the social consequences of the scientific and technological revolution, which is of unprecedented depth and scale, where millions upon millions of toilers are becoming doomed to unemployment and poverty.

Thus under the influence of the scientific and technological revolution the role of the worker class as the vanguard, revolutionary-transforming force of society, the "gravedigger" of capitalism is not diminishing but on the contrary is increasing.

Ideas of a technocratic type are also being formulated for military personnel. For example, ideas to the effect that automation of aircraft equipment has led to a purely technical execution of combat missions are being instilled in U.S Air Force personnel. Civilian casualties are explained away as technical necessity or resulting from errors by the onboard computer or information sources. In any case the pilots do not see their victims. Therefore they should not be bothered by pangs of conscience; they should be "morally impervious." Clearly the purpose of such "indoctrination" is to turn flight personnel into unthinking executors of the will of the imperialists and to remove moral and ethical obstacles to armed intervention into the affairs of nations which reject Washington's dictate.

Some bourgeois ideologists attempt to prove that as the STR has advanced, antagonistic conflicts have arisen between individual categories of military personnel in the armed forces of the socialist countries. The realities of life refute such fabrications by the bourgeois theorists. In actuality we are observing a strengthening unity of our armed forces and growth in the social cohesiveness of the Soviet people.

While acknowledging aggravation of the flaws within their society under the effect of the STR, bourgeois ideologists are attempting to substantiate another theory. It boils down to the claim that the advance of science and technology is itself an evil which threatens the demise of all mankind, regardless of societal system. There have appeared absurd proposals to halt or even turn back the development of industry and to ban a number of scientific research topics, especially in the field of genetics, nuclear physics, etc. Outwardly bourgeois ideologists would appear to advocate protection of the environment, preserving the world from nuclear missile war, but in essence they are opposing the STR and advance by mankind, the building of nuclear power generating plants, the development of electronic computer

hardware, space exploration for peaceful purposes, and the practical incorporation of other scientific and technological advances.

Such political views also indirectly serve the interests of the bourgeoisie, since they ignore the fundamentally opposite nature of approach to utilization of achievements of the STR by capitalism and socialism.

Communists maintain that all the modern achievements by mankind must be utilized for people's benefit and happiness, for the sake of a better future for world civilization. Tasks pertaining to practical combining of the advantages of the socialist system and the advances brought forth by the STR were stated in specific terms in the CPSU Central Committee and USSR Council of Ministers Decree entitled "On Measures to Accelerate Scientific and Technological Advance in the Nation's Economy," at the April (1984) CPSU Central Committee Plenum, and at the first session of the USSR Supreme Soviet, 11th Convocation. Forthcoming tasks include accomplishing full-scale automation of production and ensuring the broadest possible application of computers and industrial robots, and the adoption of flexible technology. The future of our power industry, CPSU documents emphasize, lies primarily in utilization of the most advanced nuclear reactors, and in the future a practical solution to the problem of controlled thermonuclear synthesis. Also on the agenda are such tasks as obtaining materials with preselected properties, development of biotechnology, and extensive utilization of no-waste and energy-conserving technologies in industry. All this will lead to a genuine revolution in the nation's economy and to fuller satisfaction of the needs of Soviet citizens.

Militaristic circles in the United States and the other NATO countries pursue totally opposite goals. They are utilizing the achievements of the STR for rapid upgrading of combat equipment and weapons, and they are attempting to employ all scientific discoveries and inventions to achieve military superiority over the USSR. They seek to conceal this expansionist policy with a phony, inflated myth about a "Soviet military threat."

Thus it is not mere happenstance that the contemporary STR is accompanied by an unprecedented aggravation of the battle of ideas. The significance of the mass media has grown sharply in this battle, and many new problems of ideological outlook have appeared, the resolving of which determines in large measure the ideological conviction, morale, and social activeness of the Soviet people, including the men in the Armed Forces, and their immunity to the influence of bourgeois propaganda. A decisive shift to genuine, practical problems formulated by the practicalities of life and scientific and technological advance, and a rise to the level of the great, complex tasks of proving developed socialism -- these are our party's demands on all ideological-mass political work in present-day conditions.



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GUN PROPOSED TO 'SHOOT' PAYLOAD INTO ORBIT

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) p 19

[Article, published under the heading "Briefs": "From a Cannon Into Space"]

[Text] K. E. Tsiolkovskiy advanced the following idea a century ago in his work "Snaryady, obretayushchiye kosmicheskiye skorosti na sushe i v vode" [Projectiles Which Reach Orbital Velocity on Land and Water]. Of course he was not talking about an artillery piece in the conventional meaning of the term, but rather an electrical accelerator-cannon sited on the ground. A projectile is accelerated to a velocity exceeding orbital velocity (approximately 10 km/s, figuring in losses during passage through the dense layers of atmosphere) and, breaking through the atmosphere, goes into earth orbit.

In the view of K. E. Tsiolkovskiy, such a method of delivering payloads into space has certain advantages. First of all, there is no need to launch propellant, which comprises a large part of a rocket booster's weight at launch. Secondly, the required energy is obtained from ground facilities. And finally, the acceleration device can be used repeatedly.

A "rail cannon" has been designed at the Australian National University, which is a device consisting of two current-conducting rails mounted in a tube. An electric arc spanning the rails impels a small plastic projectile forward. This technique was successfully used to accelerate a centimeter-size cube to a velocity of 6 km/s. In order to produce a velocity exceeding orbital velocity, it is proposed to place energy storage devices along the cannon tube The fact is that feeding current from only one end of the tube leads to significant losses to electrical resistance when the rail is of a substantial length.

Electromagnetic mass-accelerator projects have been reported in the foreign press. Their design and operation are essentially as follows. A payload container, provided with superconducting solenoids, is accelerated along a fixed conductor track. Upon reaching orbital velocity, the projectile separates from the container, which is decelerated in a special section of the track. Design calculations figure in projectile acceleration losses during atmosphere passage.

What are the power requirements of a unit weighing 60 tons? Calculations indicate that if it has a power of 3 trillion watts, it will only take 2 seconds to accelerate to 10 km/s.

Due to the considerable power requirements, such devices have not yet found practical application.



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AIR FORCES MILITARY COUNCIL MEETS WITH VETERANS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 20-22

[Article: "Traveling Roads of Courage and Fame: Report on Get-Together Between Air Forces Military Council and War Veteran Aviators"]

[Text] "Dissemination of the glorious fighting traditions of the Communist Party, the Soviet people, their Armed Forces, and intensification of military-patriotic and mass defense work constitutes an important task."

From the CPSU Central Committee decree entitled "On the 40th Anniversary of Victory by the Soviet People in the Great Patriotic War, 1941-1945"

Veterans.... These respected persons, who have made a substantial contribution toward building socialism and communism and toward organizing its armed defense, are esteemed by the Soviet people. Intelligent utilization of their great life, combat and professional work experience in the area of strengthening the economic and defense might of the USSR and indoctrination of youth in a spirit of faithfulness to Communist ideals and total dedication to the socialist homeland is a task of great national importance.

The experience of this work was discussed in May of this year, on the threshold of the 40th anniversary of the Great Victory, at a get-together between the Air Forces Military Council and war veteran aviators, a brief report on which is offered below for our readers.

Presenting an opening address at the get-together, Hero of the Soviet Union Chief Mar Avn P. S. Kutakhov, USSR deputy minister of defense, expressed confidence that our veteran-aviators will continue in the future making a worthy contribution to the cause of defense of the socialist homeland and will take active part in work pertaining to indoctrinating aviation personnel in the outstanding traditions of the party, people, army and Air Forces.

"We have gathered here," he stated, "to exchange views on how better to utilize your experience to develop in young aviation personnel an active experiential posture, to develop in young personnel excellent moral-political and fighting qualities, a feeling of responsibility, a heightened sense of duty to the CPSU and our people, readiness and willingness to defend the socialist homeland staunchly and ably.

"The exploits of the heroes of the Great Patriotic War are a priceless possession of ours. They contain an inexhaustible charge of enormous inspirational and mobilizing force. Turning to them with their minds and hearts, the younger generation of builders of communism and armed defenders of the homeland will even more rapidly acquire civic maturity and fighting courage and will become more deeply aware of their personal responsibility for a bright future for the homeland and strengthening of international security."

Chief Mar Avn P. S. Kutakhov emphasized that today, as we prepare to celebrate the 40th anniversary of victory by the Soviet people in the Great Patriotic War, it is more important than ever before to draw attention to the succession of generations of defenders of the homeland and to intensification of dissemination of the fighting traditions of our valiant Air Forces. The special significance of this is due to the unparalleled complexity of the international situation and the military-political situation, to the increased military threat on the part of the United States and its NATO allies, and to the extreme aggravation of the ideological struggle between socialism and capitalism.

The first person to take the floor was Hero of the Soviet Union Mar Avn S. Rudenko, who discussed the significance of get-togethers between veterans and the CPSU Central Committee and with the USSR minister of defense for increasing their activeness in agitation-propaganda work at enterprises, on kolkhozes, in military units, and at educational institutions. Representatives of the older generation of defenders of the homeland, he stressed, endeavor to show in an understandable and lively manner, citing specific facts and events, the unprecedented exploit of the people and the Armed Forces, to publicize the courage and mass heroism of Soviet citizens on the battlefront and on the home front, to explain the sources of the strength and invincibility of our nation and the countries of the socialist community, and persuasively to expose falsifiers of the history of World War II. A wise word spoken by combat veterans and their personal example also help achieve successful accomplishment of the measures specified by the general-curriculum and vocational school reform, the purpose of which is to help instill in young people industriousness, love of the homeland, Communist conviction, proletarian internationalism, and a burning hatred toward the imperialist aggressors.

The aviators greeted with considerable interest the speech by Hero of the Soviet Union Col Gen Avn I. Moroz, who discussed the contribution to the struggle for the honor and independence of our homeland by Communist and Komsomol members in the 1920's and 1930's, who were indoctrinated in the heroic revolutionary and fighting traditions of the older generation.

"Today, almost 40 years after the guns of the Great Patriotic War finally fell silent," he stressed, "there are not too many people remaining in our ranks of participants in that harsh ordeal. There are even fewer heroes remaining from the battles in the skies over Spain and China, at Lake Khasan and on the Khalkhin-Gol River. And very few of those who stormed the Winter Palace remain with us. But the strength of combat traditions lies in the fact that they do not die together with those who created and developed them, who carried them through the crucible of savage battles, penning vivid pages in the fighting chronicle of the socialist homeland."

Party full members and probationary members stood in the front ranks of those who inspired our fighting men to heroic deeds on the battlefront and on the home front, who by their personal example fired up their comrades to assault the enemy. "Communists, forward!" These words became a battle cry, inspiring combat pilots to perform combat exploits in the skies. Thanks to young pathfinders, we are even today learning about many of them. The history of the Great Patriotic War continues to add moving documents attesting to the fearlessness, courage, and great dedication to their homeland on the part of Soviet citizens. "Nobody and nothing has been forgotten!" -- this is not a slogan, but a profound, heartfelt acknowledgment both to those who gave their lives for their homeland's bright future and to those who, having gone through all the ordeals, continue in service today, actively laboring on the fertile soil of heroic-patriotic indoctrination of the present generation of aviators.

Stressing that heroic-patriotic indoctrination work is expanding in military units, just as throughout the country, Col Gen Avn I. Moroz called upon the veterans to take part even more actively in organizing interesting discussions at combat glory museums and rooms and in holding special morning and evening activities.

The audience listened closely to three times Hero of th Soviet Union Col Gen Avn I. Kozhedub Telling about his own personal combat experience, he discussed the sources and strength of revolutionary and fighting traditions and their importance for achieving success in difficult military labor by the present generation of aviators.

The speaker stressed that the movement for the right to be called successors of the aviators of the war years has become widespread in the regiments and squadrons. Guided by commanders, political workers, party committees and Komsomol committees, it is gaining strength and becoming an important form of dissemination of fighting traditions. Young people, joining in this movement, thoroughly study the biographies of pilots, navigators, and other wartime specialists, and seek to find out how they mastered and operated their aircraft, how they learned expertly to service and maintain it, and what character traits were most typical of them.

"In this connection," Col Gen Avn I. Kozhedub concluded his thought, "it is very important to employ forms of indoctrination work which would affect not only the minds but also the hearts of young aviation personnel, awakening them to activeness, developing in them a genuine readiness and willingness to carry

on the cause of their elders -- skillfully, with dignity and honor serving difficult duty and vigilantly guarding the borders of our beloved socialist homeland."

Hero of the Soviet Union Col Gen Avn S. Kharlamov, deputy chairman of the DOSAAF Central Committee, delivered an interesting address, reporting on successes in military-patriotic indoctrination of young people and preparing them for military service in the All-Union Voluntary Society for Assistance to the Army, Air Force, and Navy. As we know, today it unites approximately 90 million persons and is implementing in a practical manner Lenin's behests pertaining to the totally popular nature of defense of the socialist homeland and is indoctrinating youth in a spirit of Soviet patriotism and total dedication to the cause of communism.

The speaker stated that DOSAAF organizations maintain close ties with veterans of the USSR Armed Forces, with military garrisons and aviation units. Joint special morning and evening activities, military technical classes and military athletic games are organized as a rule with the active participation of the party and Komsomol activists of military units. Some of them are held on the territory of aviation garrisons. Service schools hold annual open-house days for preinduction and induction-age youth.

"Aviator veterans," the speaker stated, "can do and are in fact quite willingly doing a great deal toward the indoctrination of today's youth. It is appropriate at this point to recall a statement made by USSR Minister of Defense MSU D. F. Ustinov, member of the CPSU Central Committee Politburo: today's army and navy life is inconceivable without constant lively contacts between military personnel and veterans of the party and Armed Forces, Heroes of the Soviet Union and Heroes of Socialist Labor, as well as veterans of the Civil War and Great Patriotic War. A word spoken by veterans -- people who are a living embodiment of the great fame of the Armed Forces -- exerts enormous influence on the minds and hearts of young servicemen. The activities of veterans -- both those who continue to serve in the army and navy and those who are working in various areas of the building of communism, as well as those who are now enjoying a deserved rest -- require constant attention and support on the part of commanders, political agencies, party and Komsomol organizations."

The addresses by twice Hero of the Soviet Union Maj Gen Avn (Ret) A. Vorozheykin, Hero of the Soviet Union Col (Ret) M. Gallay, Lt Gens Avn (Ret) S. Fedorov and M. Kosykh, and Lt Col (Ret) I. Chernobay were both emotional and memorable. They noted that each year worthy replacements join the defenders of the homeland in the USSR Armed Forces -- young people with a good general-curriculum education, and that it is the duty of veterans to ensure that even prior to conscription into the military youths have the opportunity to gain a truthful, objective idea about the nature of military labor, the sacredness of military duty and inviolable faithfulness to the military oath.

Hero of the Soviet Union Lt Col V. Shcherbanko spoke on behalf of the present generation of defenders of the homeland. Speaking on how to educate a person capable of performing heroic deeds in the name of the homeland and how to prepare a youth to carry out his sacred constitutional and internationalist

duty, he described the military-patriotic work being conducted in the line units. Commanders and political workers, explaining the decisions of the 26th CPSU Congress and subsequent CPSU Central Committee plenums, as well as the instructions of CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, on defense matters, devote serious attention to publicizing the combat experience of combat veterans from the same outfit. The white-haired authors of combat know-how explain to the winged youth at regimental get-togethers what each aviator's personal contribution toward crew and squadron combat readiness should be. These include first and foremost rapid mastery of one's occupational specialty, a high proficiency rating, daily and hourly effort to surpass performance standards and to achieve excellent maintenance and efficient utilization of aircraft and weapons.

"Exemplary performance of one's duties," summarized Lt Col V. Shcherbakov, "and a campaign to achieve excellent performance during each and every flight operations shift, each and every training day build a road to the highest manifestation of courage -- a heroic deed...."

During the last war Soviet patriotism engendered mass heroism. Today as well it motivates personnel to accomplish military feats for the sake of security of the peaceful labor of the Soviet people. A social, class understanding of patriotism constitutes a guarantee that military aviators will carry out their constitutional duty in an exemplary manner.

At the same time the Soviet Armed Forces are an outstanding school of indoctrination of our youth, a school of character development and maturation for the defenders of the homeland, active builders of communism. To enhance the indoctrinational role of military service and the effectiveness of heroic-patriotic measures means to increase the effectiveness and improve the quality of ideological and political-indoctrination work on the basis of a combined approach to it, tirelessly strengthening observance of regulations, discipline and organization of aviation personnel and the combat readiness of units and subunits.

These issues were discussed in detail in an interesting address by USSR Deputy Minister of Defense Hero of the Soviet Union Chief Mar Avn P. S. Kutakhov, commander of chief of the Air Forces, who noted that, in implementing the decisions of the 26th CPSU Congress and the instructions of the CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, on defense matters, in the period of preparation for the 40th anniversary of the Great Victory the commanders and political workers of aviation units, together with Air Forces veterans, are doing a great deal of work connected with further stepping up publicizing Lenin's behests to military personnel and the fine traditions of the Communist Party, the Soviet people and its Armed Forces.

On the threshold of the 40th anniversary of victory by the Soviet people in the Great Patriotic War, stressed Chief Mar Avn P. S. Kutakhov, the task consists in consolidating successes in heroic-patriotic indoctrination of personnel, building upon them day by day, taking all measures to ensure continuous increase in the effectiveness and efficiency of dissemination of

the fighting traditions, experience and know-how of combat veterans, and resolutely correcting existing shortcomings. In lectures and reports one should even more deeply and comprehensively reveal the essence of the rich traditions of our party and people -- such as devotion to the cause of communism, ardent love of the socialist homeland, burning hatred toward our class enemies, unswerving confidence in victory, selflessness and heroism in struggle with our enemies, proletarian solidarity with the toilers of all countries, and the fighting partnership among servicemen of the socialist countries. Particular attention should be devoted to vivid and persuasive demonstration of how servicemen in present-day conditions are sacredly preserving and building upon the traditions of the older generation and how they are working to achieve a high degree of combat skill, to strengthen discipline, and to increase political vigilance and combat readiness.

The commander in chief of the Air Forces noted that get-togethers between personnel and veterans of the party and participants in the Great Patriotic War are being organized on a regular basis at aviation garrisons, in units and subunits. Young personnel listen to the stories of the veterans with great attention and interest.

Demonstration of the unprecedented exploit of the Soviet people and their Armed Forces and explanation of the sources of the invincible might of the socialist state and the decisive significance of the leadership role of the Communist Party in achieving the Great Victory should occupy a central position in the activities of agitation and propaganda teams attached to political agencies, agitation and propaganda teams attached to party committees and buros, and agitation and propaganda committees of veterans' councils.

The Air Forces have long followed the practice of "agitperelety" [agitation flights], trips to distant garrisons by propaganda teams, which mandatorily include lecturers, persons active in science and culture, military veterans, and amateur talent performers. Such groups do a great deal of ideological-theoretical, political-indoctrination, and cultural-educational work. It includes a great many activities of a heroic-patriotic directional thrust, which leave the aviation personnel filled with enthusiasm, optimism, and a strong purposefulness focused on practical activities. This fine tradition, stated the commander in chief of the Air Forces, should be given across-the-board support and experience proper, worthy development.

It is very important in the course of contact with servicemen to develop in them a feeling of pride and responsibility for serving in guards units and combined units and in military units bearing honorary designations, holding combat decorations, awarded Memorial Red Banners, Certificates of Merit of the CPSU Central Committee, Presidium of the USSR Supreme Soviet, and USSR Council of Ministers, and a USSR Minister of Defense Pennant for courage and military valor.

At the conclusion of the get-together the gathered assemblage adopted a letter of greeting to the CPSU Central Committee, Presidium of the USSR Supreme Soviet, and USSR Council of Ministers. They assured the CPSU Central Committee and Soviet Government that they would devote all their energies,

knowledge and experience to the cause of further strengthening the defense capability of the socialist homeland, the combat power of its valiant Air Forces, and indoctrination of aviation personnel in a spirit of the highest vigilance and continuous combat readiness.

This get-together between veterans and the Air Forces Military Council offered persuasive confirmation of the unity of all generations of Soviet servicemen, their firm unity behind the party Central Committee and their total support for its Leninist course of domestic and foreign policy.



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SOVIET GROUND ATTACK TACTICS IN WORLD WAR II REVIEWED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 27-28

[Article, published under the heading "Experience Born in Combat," by Hero of the Soviet Union Doctor of Historical Sciences and Professor Maj Gen Avn N. Platonov: "Hitting an Encircled Enemy Force"]

[Text] The successful advance by the forces of the Second and Third Ukrainian fronts in the course of the Iasi-Kishinev Operation by 24 August 1944 culminated in the encirclement of a large fascist force southwest of Kishinev. The bulk of this force was positioned east of the Prut River.

Annihilation of this force grouping was undertaken by units and combined units of the ground forces and the 17th Air Army. The aviators conducted systematic air reconnaissance and delivered continuous ground-attack and bombing strikes on concentration areas and troop columns of the encircled enemy force. In a span of just 4 hours on 25 August ground-attack aircraft and fighters of the 9th Composite Aviation Corps flew more than 300 sorties to wipe out a large enemy force discovered in the vicinity of the community of Lopushna. Smoke, dust thrown up from the bursting of artillery and mortar shells, as well as forest fires made it difficult for the pilots to gain their bearings, to locate targets and determine the forwardmost positions of friendly forces. The ground-attack aircraft and fighters, however, utilized primary reference points, information from leader aircraft and air controllers in the ground formations to spot strike targets.

On 26 August, on the east bank of the Prut, the enemy undertook a desperate attempt to break out of encirclement. He focused the principal attack by large forces on Sarata-Rozesh. As a result of continuous assaults, there developed a real possibility that a large group of fascist motorized infantry and tanks would break out of encirclement.

At that time our 951st Ground-Attack Aviation Regiment was based at a field airstrip near Razdel'naya railway station. The regimental commander, Gds Maj I. Krasnochubenko, had been assigned the mission to hit the enemy and assist the ground troops. Our air squadron, consisting of 12 aircrews, escorted by six La-5 fighters from the 31st Fighter Regiment, was to operate 2 kilometers north of Sarata-Rozesh.

The aircrews quickly readied for the mission. We knew the objective area well. We laid out a route, designated prominent landmarks, and devised a plan of action over the target. Preparation for combat sorties was usually conducted in a dugout shelter set up as a classroom. Here the pilots would study the mission, share know-how, choose expedient methods and tactics, and brief themselves on the enemy's equipment and tactics. As a rule, at the end of the briefing session the squadron commander would test the pilots and gunners on their knowledge of the situation and procedures over the target as well as coordination with the fighter escort. General matters pertaining to support of our aviation regiment's actions would be coordinated on the eve of an operation at a meeting of ground-attack and fighter group leaders. We should note that from the time of the Battle of Kursk the 951st Ground-Attack Air Regiment was working in coordination with the 31st Fighter Regiment. Almost all group leaders and pilots knew each other and had a good understanding of one another in the air.

As soon as the order came from the regimental command post, the squadron took off from the field airstrip and formed the flights up into echelon right. Formation depth ran 350-400 meters. We approached the airfield of the 31st Fighter Regiment at a height of 300 meters. We were soon joined by the fighter escort, under the command of Capt V. Kirilyuk. Flying in an integrated formation, the group descended to treetop level and, with the flights formed into echelon right at forward spacings of 250-300 meters and lateral spacings of 25-30 meters, proceeded to head for the target.

The fighters flew on the flanks, 25-30 meters higher than the Ils, at spacings of 100-150 meters. This formation ensured the ground-attack aircraft and fighters freedom to maneuver en route and the element of surprise in reaching the target and attacking it. From low altitude, however, it was very difficult to spot troops and camouflaged equipment on the forested, irregular terrain. Nor could we fly at a higher altitude, in order to prevent the enemy from spotting our aircraft before we spotted him.

As we passed over a guidance station I received information on the air situation and refined intelligence on the enemy. We were headed toward Sarata-Rozesh. Soon we spotted in a ravine a large column proceeding toward the Prut crossings.

Thick haze from forest fires filled the air above the forest and ravines adjacent to this community. The fascists were convinced that with poor visibility the Soviet pilots would not spot the column. As soon as we determined the column head, I gave the command to form into "circle of pairs" left and, accompanied by my wingman, Lt G. Pogudin, proceeded to attack the lead armored personnel carriers and troop-carrying trucks. Lts P. Golovko, I. Primakin, M. Rybak, G. Odnotsenov, and A. Logvinenko, attacking in a shallow dive from a height of 400 meters, fired their rockets. Several trucks and armored personnel carriers caught fire. The column ground to a halt. On the second pass the Ils dropped antitank and small fragmentation bombs. Since the target was long and narrow, the pilots bombed in series, one door at a time.

The fascists opened heavy fire. Oerlikon tracers streamed toward the Ils. A specially-designated third flight, under the command of Lt G. Odnotsenov, without breaking from the common formation, attacked the sources of antiaircraft fire.

After the third and fourth attacks, the number of vehicles burning on the road had increased. Having released their bomb load, the ground-attack aircraft came in at low level, delivering cannon and machinegun fire at individual targets. In "circle of pairs" formation, at increased forward and lateral spacings, the pilots independently selected targets, individually aimed and destroyed them. During this time our fighter escort was neutralizing enemy antiaircraft weapons as they came to life.

The mission was accomplished. I gave the command to reassemble. At a height of 100 meters, the flights formed up in echelon right, the squadron proceeded to head back to its field.

That evening a report was received from headquarters of the 9th Composite Aviation Corps that the strikes by the ground-attack aircraft had helped units of the 37th Army rapidly crush and capture a large fascist force near Sarata-Rozesh. For the support we had given, the squadron's fliers received a commendation from the ground forces command.

A few enemy groups, however, succeeded in breaking out of the ring of encirclement. They were rapidly moving toward the Prut bridges and crossings to link up with forces operating in the foothills of the Carpathians. It was therefore very important to demolish the bridges and crossings, in order to prevent the enemy from crossing over to the west bank of the river.

As we know, destroying a river crossing is one of the most difficult missions. Bridges offer a narrow target, it is very difficult to hit a bridge accurately, and a close burst off target is ineffective. And strong air defense impedes the task of aiming accurately.

Toward evening on 26 August the regimental chief of staff, Maj P. Akimov, assigned our squadron precisely such a mission. We were to destroy a pontoon bridge near the town of Leovo. The major warned us that we would not have any specifically assigned fighter cover, but fighters from the 295th Air Division were patrolling in the target area.

How were we to locate the crossing site? This was the first and most difficult question in preparing for the mission.

"The easiest thing is to fly to Leovo and look along the river from there," suggested flight commander Lt I. Primakin.

"As a rule troops and equipment accumulate on the roads and in the villages by crossing sites," commented P. Golovko.

These officers' comments were taken into consideration when devising a plan for searching for and attacking the target.

After completing the mission briefing and plotting routes, the command came: "To your aircraft!" The group set out, in a column of two units of 6 aircraft each, flying echelon right. The trailing pairs in the 6-aircraft groups were assigned the mission of suppressing and destroying enemy antiaircraft weapons.

The route crossed highly irregular, variable-profile terrain. The ground-attack aircraft reached the target undetected, encountering no enemy fighters. This ensured the element of offensive surprise. The enemy offered practically no opposition, which could dull the vigilance of the pilots and gunners, who concentrating their entire attention on the bombing. It became necessary to warn the aircrews to be alert. This was done just in time. Literally one minute later my gunner reported sighting a group of four enemy fighters. I radioed the others to close formation and to prepare to fight off an attack. The pilots closed up the "circle."

We had flown four passes, but the crossing seemed to be charmed: it was still unscathed. Bombs burst alongside the bridge, raising fountains of water, but not one direct hit. The aircraft flown by Lt Ivan Primakin then went into a 60 degree dive. A Messerschmitt was on its tail. The gunner met the enemy with a long burst from his heavy-caliber machinegun. But nothing could turn the ground-attack aircraft from its course. The pilot took careful aim and released his last bomb. The bomb burst -- pontoons and decking proceeded to float down the river.

It was time to break off the attack. But enemy fighters were literally poised over the squadron. Stretching the circle out into an ellipse for mutual covering fire, we withdrew laterally and dropped to the deck. As soon as our aircraft were out of range of the fascist antiaircraft guns, I gave the command to form a column of groups of six. At this time the enemy fighters attacked. But our gunners crippled one aircraft with smoothly delivered fire. The others proceeded to attack with greater cautiousness. Soon the Messerschmitts fell behind, and the squadron reached our field without any losses.

Lt N. Gladkikh was the first to land: his gunner, Sgt G. Lisitsyn, was wounded in the head and shoulder. The remaining aircraft then landed in sequence.

As always, a detailed debriefing was held in the squadron following the mission. This was the most effective form of learning, passing of experience and know-how, warning of and preventing mistakes. While the debriefing was in progress, ground technicians, airframe mechanics, powerplant mechanics and armorers readied the aircraft for the next sortie.

The regimental commander arrived. He reported that the Hitlerites had set up new crossings north of the town of Leovo.

"Every minute counts," the commanding officer stated. "You will take off immediately. The sooner we knock out the crossings, the more Hitlerites will remain in the Kishinev encirclement."

This time fighters escorted us to and from the target.

Ground-attack and fighter tactics continued to be perfected in the course of combat operations against the encircled enemy force in the Iasi-Kishinev area. The element of surprise in the initial attack on an enemy underway in close march columns assumed decisive significance. This enabled us to inflict substantial losses on the fascist forces.

Combined utilization of various methods of navigation, target search, radioed information from guidance stations and leader aircraft made it possible to proceed precisely to the targets at extremely low level and to hit them on the first pass. A combination of bombs, rockets, machinegun and cannon fire, and a correct selection of ordnance load according to the specific situation increased the effectiveness of ground-attack aircraft. Successful accomplishment of combat missions with minimum losses was promoted by skillful maneuvering of combat formations, which ensured precise, aimed strikes, repulsion of fighter attacks, and safe return to base.

The Moldavian SSR and the Izmail region of the Ukraine were liberated as a result of completion of the Iasi-Kishinev strategic operation.

The aviators of the 17th Air Army crossed the borders of the USSR. Our much-suffering native land, seared by the flames of battle, lay behind us. Ahead of us would be fighting in the skies above other countries, the peoples of which were still languishing under the fascist yoke.



3024
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PILOTS SHOW DANGEROUSLY CAVALIER ATTITUDE TOWARD COCKPIT PROCEDURES

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) p 29

[Article, published under the heading "Analyzing a Near-Mishap Situation," by Military Pilot-Expert Marksman Lt Col A Zimin: "No Accident Occurred, But...."]

[Text] The airfield sprang to life with the first rays of the rising sun. Out on the flight line, groundcrews readied combat aircraft for flight operations, while flight personnel, completing a cockpit procedures drill, assembled in the briefing room. While the pilots and navigators detailed their assignments, the weather reconnaissance aircraft, which had returned from a weather look, taxied back to the ramp. The glowing ball rising above the horizon seemed to be confirming that the weather would be good that day.

All items pertaining to organizing flight operations were detailed, and fresh weather data had been obtained. Final instructions by the officer in charge of flight operations, followed by the command "To your aircraft!" Everybody was in an elevated, happy mood.

Aircraft commander Capt S. Padar and navigator Capt V. Kondakov took their places in the bomber cockpit. On their first training sortie they would be heading for the practice area. Receiving clearance from the tower, the pilot proceeded to fire up his engines. As the pilot idled his turbines, warning lights flashed on the panel, indicating low fuel pressure in the engines. Time was of the essence, however, and Capt S. Padar, reporting normal engine operation to the tower, requested taxi clearance.

After taking off, the crew headed for the practice area and proceeded to work on the scheduled maneuvers. But they were unable to complete the assignment: within minutes the Fuel Critical annunciator lit up.

Reporting the situation by radio to the flight operations officer and receiving his instructions, Captain Padar immediately headed back toward the field. The field was placed on emergency. The flight operations officer had to take measures to ensure that things continued operating smoothly in the approach and landing sequence. The aircraft landed safely....

Here is another example. Capt S. Sushko, having successfully completed his training sortie and putting his aircraft down right on the numbers, taxied to the ramp. The last thing remaining was the cockpit procedure sequence to shut down the engines. But instead of switching off the air conditioning system the pilot switched on the... emergency fuel jettison. A white cloud of kerosene fumes formed to the rear of the aircraft. A fire was avoided by sheer luck.

What was the cause of both near-mishap situation? The debriefing indicated that the cause was undue haste and incompetent performance by the aircrew in performing cockpit procedures. In the first instance the navigator, Capt V. Kondakov, had failed to verify that all required circuit breakers were set. It was determined that the transfer pumps were switched off, and naturally fuel was not being pumped into the on-line tank. As a result the Fuel Critical annunciator lit up while they were in the air. In the second instance the pilot simply had mixed up toggle switches.

And what did the other aviators think about these incidents? For the most part they attributed the mistakes to carelessness. Such an explanation was clearly superficial, however.

A more thorough analysis indicated that after starting up the engines Capts S. Padar and V. Kondakov had noticed the warning lights but had failed to attach any significance to them. Possessing a poor grasp of the physical substance of the processes taking place in the engines, they considered illumination of the warning lights to be a trivial matter. As they saw it, pressure would increase and the lights would go out. This does happen. In addition, their desire to take off precisely on schedule and proceed with the assignment won out over good sense. Consequently the reason for the near-mishap situation lies not in carelessness but in poor knowledge of the aircraft by the crew members and in their failure to observe procedures of verifying that the aircraft was in proper operating condition prior to takeoff.

The squadron commander reached a somewhat different conclusion about S. Sushko's error. Analysis indicates that the pilot had mixed up switches not through negligence but because he had not been taught to check and verify his every action. Automatism is absolutely essential in flying. But it is for good reason that we talk of conscious automatism. That is, if you grab a lever or switch, take a look and determine that it is the correct one.

If one thoroughly examines the causes of such errors made by pilots and navigators in the performance of cockpit procedures, a conclusion suggests itself: most of them occur because some fliers do a poor job of preparing for flight operations and devote little attention to studying the equipment and its operating procedures and to cockpit procedures drills. After all, the mandatory cockpit drill prior to a flight is not a mere whim on the part of the higher-ups but a practical demand of flight operations, specified in the appropriate guideline documents. Consequently, failure to observe the requirements of these documents is nothing other than a lack of professional discipline. Nevertheless, during the period of preflight operation aircrews do not always adequately drill in the aircraft cockpit and do not mentally go through the flight from engine ignition to engine shutdown. Such a cavalier

approach to ground preparation becomes a cause of disturbing errors in the air.

We should also mention that at times flight personnel are too complacent when they board their aircraft. Sometimes crew members, upon taking their places in the cockpit, do not check the status of those switches which are supposed to be switched on by the ground crewmen. This is not excessive trustingness but rather elementary failure to perform one's duties.

The cockpit of a combat aircraft is the workplace of the pilot and navigator. Each should be intimately familiar with it, for in the air a crew member has mere seconds to manipulate a given switch, especially in an emergency situation. And a mistake can cost very dearly.



3024
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GENERAL KULIKOV LAUDED AS OUTSTANDING BOMBER PILOT, COMMANDER

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 30-32

[Article, published under the heading "Marching in the Vanguard," by Col O. Nazarov: "On Long Flights"]

[Text] A group of heavy aircraft [photo accompanying article shows aerial-refueling Tu-95 "Bear" bomber] made rendezvous with the aerial tankers above the expanse of ocean precisely at the designated time and place. Group leader Maj Gen Avn Mikhail Alekseyevich Kulikov and his crew were the first to complete the refueling procedures, and now, pulling away a short distance, Kulikov observed his left wingman. Within a few minutes to completion of refueling, the aircraft suddenly dropped away sharply, the cone remained mated to the refueling probe, while the refueling hose tore away at its base and, seized by the slipstream, lashed the fuselage like a giant whip, hitting the stabilizer and tail fin....

In aviation there are moments which are almost unpredictable in advance, when the outcome of a flight is decided by seconds.

"Slow to minimum controllable airspeed! Commence descent, turn toward the coast," Kulikov immediately commanded.

It took the wingman time to turn the heavy aircraft. The hose continued lashing the fuselage. If something were not done immediately, catastrophe was inevitable: they were hundreds of kilometers from shore, and the nearest available airfield was much further....

The wingman, well aware of the seriousness of the situation, made an intelligent decision. Two or three short bursts fired by one of the aircraft's cannons, and a large piece of severed hose was carried away by the slipstream. This greatly alleviated the situation. The group safely completed the flight.

Self-control, excellent flying ability, knowledge of the aircraft, and confidence helped the aircrews emerge victorious from a difficult situation.

The life of every military aviation commander is a life of constant preparedness to make an intelligent, unerring decision under conditions where time is of the essence, and sometimes virtually instantly.

A crew is strong by virtue of its monolithic nature, welded together by hundreds of invisible threads, attachments, habits, traditions, and the fact that it has repeatedly surmounted dangerous and difficult situations. A great deal also depends on the commander, on the job he does on the ground and in the air, on the relationship he establishes with his crew. The commander must take everything into account: the character and personality of each of his men, his experience and know-how, and his level of knowledge. He sets the tone for businesslike, friendly relations, but he does not diminish his demandingness.

...Kulikov had dreamed of aviation from childhood. But his childhood had occurred during the harsh wartime years. Things were difficult without his father -- he had gone to the front. His mother had four children to care for. But Mikhail did not give up his dream of flying. And he achieved his objective: he enrolled at the Balashov Flight School, served for several years as copilot, and subsequently as aircraft commander. His assignments became increasingly more complex and responsible. He was awarded the Order of the Red Star in 1956 for successes in combat and political training and for mastery of complex combat equipment.

It would seem that he had achieved a great deal during his years in the service. But Kulikov realized that life was moving forward and imposing increasingly tougher demands. And he enrolled at the Air Force Academy. He studied the course materials avidly and persistently, especially aerodynamics, mathematics, and tactics. He wanted to prepare himself better to master the new aircraft which were entering service in place of the existing ones. Physics and mathematics helped him better understand the operating principle of the various instruments, the essence and substance of the transformations taking place in them.

The academy also provided him with a great deal in the area of methodology of conducting training classes, prepared him to work with others, and taught him the ability to think in a tactically competent manner in preparing for any combat mission.

In the meantime life was preparing a serious test for him. A group of graduates who had logged considerable flight time was asked to transition to new aircraft. Of course nobody was twisting their arm: it was strictly voluntary. But Mikhail Kulikov is not a person to turn down the new and unknown. It seemed that all he had done his entire life was look for difficulties.

He spent many long hours studying manuals and descriptions, "flying" on the simulator, familiarizing himself with cockpit procedures and memorizing the location of instruments. His skills grew, and his actions became faster and smoother.

In his new position Mikhail Alekseyevich endeavored from the very outset to become part of the unit as quickly as possible, thoroughly to study the men and to understand their concerns. He knew that his image and influence would depend in large measure on his personal skill. He must first of all fly the new aircraft himself, and not only catch up with but pass his men in his level of proficiency.

The day came when Kulikov went up in the new aircraft. He had prepared well and thoroughly rehearsed every movement and procedure on the flight simulator. Nevertheless his previous habits were a noticeable hindrance. If he became distracted, he would automatically perform an extraneous, useless motion. Simulator drills and actual flying were the only things which could correct the situation. Therefore he worked hard on the flight simulator and practiced flying the actual aircraft. Soon he was doing as good a job as those who had transitioned to the new aircraft earlier, and in time was doing a better job. This is quite natural: he had received solid theoretical training and, in addition, had displayed great determination and persistence.

Things were more difficult with his outfit. Discipline was a bit slack. It is true that no serious violations were noted, planned targets were met, but he could not accept this as satisfactory.

...He was leaving headquarters one beautiful, quiet evening. Clouds were drifting slowly high up in the sky, a sky of an unusually blue hue for autumn. The setting sun was tinting them pink. Dry leaves rustled underfoot, picked up and scattered by the wind. If only one's cares could be carried away so easily by the wind! But you can't escape them....

Kulikov never feared problems, however. There was something else -- dissatisfaction with himself. Yes, with himself. The main element was gradually taking form, as if in a film developer solution: where he had erred, where he had fallen short. Every individual is unique and easily hurt. And in the bustle of the daily routine he somehow lacked the time to listen to everything a person had to say and to understand him. The work schedule, flight operations, logging flight time.... All this of course is important. Nevertheless man is the main thing. Not simply pilot, navigator, engineer, or technician, but man!

Kulikov spoke at party and Komsomol meetings about the responsibility of each individual for the common cause. The outfit did not take shape, was not created suddenly, all at once; it took time for it to become a unified military family, where each individual felt responsible for everybody else.

Alongside indoctrination of his men, Kulikov continuously concerned himself with increasing the combat proficiency of the crews. There were problems here. Some pilots and navigators, having achieved good results in combat training or earning a first class proficiency rating, felt that there was nothing more for them to learn, that they knew everything. This resulted in a paradox: the younger personnel would carry out flight missions with great enthusiasm, endeavoring to improve their combat skills, while their teachers,

who should be setting an example, were unenthusiastic about their job. Some of the young officers, observing them, would lose interest in study, and their enthusiasm would wane.

Mikhail Alekseyevich, supported by his deputies and the party organization, waged a resolute campaign against such attitudes. At training classes and during preparations for flight operations he would drum into his men that he who has learned nothing new today will begin to fall behind tomorrow. He demonstrated by personal example how one should inquisitively and innovatively approach solving each new problem, seeking new and better tactical devices, studying the equipment in order more fully to utilize the capabilities both of the aircraft and the ground support facilities.

The commander was also demanding both toward the rank and file pilots and toward their teachers. He made special allowances for nobody. He kept a particularly close watch to ensure that the detachment commanders prepared in detail, for it was their duty to teach their men, to explain to them complicated matters which they did not understand, and to lead them. But there were also some who lived somehow apart: they would come to the field, log their hours, and leave. The interests of the collective seemed not to touch them. Mikhail Alekseyevich subjected such individuals to criticism at a party meeting.

"Among pilots there should be no individuals who have a clerk-bureaucrat's attitude toward the job," he said. "We are faced with important, responsible tasks. We have common interests. And there should be no indifferent individuals here."

At Kulikov's initiative commanders began more frequently conducting joint training sessions for specialists of the ground services and flight personnel. This helped bring people close together, giving them an opportunity to become better acquainted with the job of each individual and in the final analysis to improve the quality of performance of many tasks.

Some pilots experience difficulties with night landings The commander assumed the job of overseeing their training. With the slightest mistake or lack of precision he would painstakingly look for the actual cause. He would not ignore a single violation of procedures. After briefing a pilot on the ground he would frequently take to the air himself and demonstrate how to land the aircraft properly. He followed the old, tried and proven method -- teaching by personal demonstration. He also enlisted the leading, best trained pilots to this task. They would share their experience and know-how at debriefings and conferences and relate how they had achieved better performance results.

...For a long time the technical maintenance unit was a sore spot -- things were not working well there. The commanding officer spent many evenings together with the engineer and his deputy commander for political affairs pondering the question of how to change things for the better. They decided to turn to the community, to Communists and Komsomol members. They set up a two-shift operation and initiated a campaign for a high degree of competence in maintenance work. The quality of aircraft maintenance soon showed appreciable improvement.

Before long the former deficiencies were no longer occurring. The workforce became cohesive and smoothly running. By the end of the year, when final performance evaluations were being made, the technical maintenance unit had become a vanguard performer, and the outfit led by Kulikov took first place.

An aircraft commander who has known Alekseyevich many years described him perhaps best of all.

"Some commanders, concerning themselves with ensuring that the mission is accomplished, do anything to avoid the slightest risk," he began. "As a result, on the one hand combat readiness, skill and the ability to fight would seem to improve, but on the other hand there are many compromises with realism and various limitations, which of course are not beneficial. They explain their position quite simply: if it becomes necessary, in combat one can take a risk. One must be prepared for this at all times, however. Training activities involving daring and a certain risk are indispensable. Courage and fortitude cannot be instilled with appeals. Some commanders at times see the slightest risk a dangerous, accident-threatening situation. The pilots under them become accustomed to hothouse conditions. Kulikov is not such a person. He trains his men in a situation approximating actual combat, and he develops in them qualities which are essential in actual battle."

Falling silent for a moment, the officer then confided: "I was involved in an incident after which they wanted to ground me. I was working on midair refueling procedures. On one occasion I was unable to maintain position alignment after contact and involuntarily caused the aircraft to shake. Afraid of tearing loose the docking cone I disconnected. The same thing happened on subsequent flights. I began to lose confidence.... I tried to overcome my fears, but in vain. I was dogged by the thought: 'It's going to happen again!' The close I got to the cone, the more I would get the aircraft shaking. I was agitated and nervous. I felt that I could not accomplish the job. In short, my entire future was on the line. At this point Kulikov came to my aid. 'I will come along on the next flight,' he promised. And he kept his promise. Just before contact he merely said: 'Take it on in, you'll get a hard connect!' He was right. After a few more flights with him, things proceeded to go right. Yes, Kulikov is a real commander! When he came to our squadron, it was in last place. He himself worked from morning to night and also made everybody else work. And he found the right approach to each individual. The main thing is that everything about him is simple and clear. He never wastes words. And of course he is also an excellent pilot. He handles his ship as smooth as silk in the air. He will complete a flight lasting many hours as fresh as he started. He never forgets about the men. In short, a perfect leader," the aircraft commander concluded.

Time marches on inexorably. Many years have passed since that time. Mikhail Alekseyevich has advanced several rungs on the career ladder. He has been entrusted with an important, critical job. And, just as in past years, he gives it his all. On one flight Major General Aviation Kulikov was check-riding a squadron commander. Kulikov knew that he was an excellent pilot and fine teacher. The midair refueling was to take place above mountains. Faced

with an unfamiliar situation (proximity of mountain peaks, buffeting), the squadron commander suddenly lost his composure somewhat. He obviously needed assistance, although usually, when flying above the sea or flatland, he always performed with confidence and precision. Perhaps it is true that moral support and personal example are absolutely essential. Kulikov came to his aid. The pilot calmed down, regained his composure, and accomplished the mission without further incident. He has performed many refuelings since and in more difficult conditions, but he has never again lost faith in himself.

The personal example of the commander is more important in the Air Forces than anywhere else. At a certain exercise General Kulikov was leading a group of heavy bombers. There had been a heavy snowfall the previous evening. By morning a narrow strip had been cleared on the runway. The snow to the sides was piled up higher than the aircraft. Kulikov was the first to take off. Behind him came his wingmen, heartened by his actions. They encountered a solid line of thunderstorms as they were approaching the range. It seemed that they could not continue on that route. But an exercise is a test of readiness for actual combat. Kulikov stubbornly looked for a way through the front. For more than an hour and a half the aircrews threaded their way in close proximity to thunderheads, finally found an open gap, reached the range on schedule and successfully accomplished their mission.

...It was a difficult time: freshly-commissioned pilots had arrived, but they were short of instructors, and the commanding officer himself frequently had to take pilots up dual. But he did not complain: he wanted to get to know them better anyway. Things are different in the air than on the ground -- in the air it is more apparent what each pilot is capable of doing. A person is revealed more fully when he is busy at work; everything extraneous is stripped away.

After their return he spent some time in the tower and made sure that the night flights were proceeding strictly according to schedule. Only after this did he go home to get some rest, for in the morning he would be in the air again. He got to bed after midnight, at about 0200 hours. He had barely fallen asleep when the telephone woke him up. By habit he glanced at his watch: 0415.

"Comrade general, Petrov's aircraft is on fire!" Mikhail Alekseyevich recognized the voice of the flight operations officer and immediately became fully awake.

"I'm listening...."

"Petrov radioed that they had a fire on board! At that point we lost communications...."

Every second counted at this point. They were expecting action, specific instructions from him, particularly since the flight operations officer was not very experienced. Judging by his tone of voice, he had lost his composure in a difficult situation.

"Where is he?"

"On base approaching final. He may not be able to land it...."

"Get on the radio. Just because he doesn't reply does not mean he isn't receiving. Clear him for an immediate landing. Make sure he has switched on his fire-extinguishing system. Put the field on fire alert. Get all your equipment ready. Get the lights on!"

"Yessir!"

"Put the receiver down on the desk so I can hear," Kulikov added.

While he dressed he listened to the orders being issued by the flight operations officer and analyzed the situation.

"Comrade general, the flames have abated somewhat...."

"What is burning?"

"Starboard wing. He is receiving me. He is on final...."

"Send a car here immediately!"

"I have already sent one, comrade general...."

Soon Kulikov was at the field. The aircraft had landed safely. It seems that some fuel had flowed out over the wing, and when the aircraft had banked, fuel made its way under the navigation light lens and ignited. The guilty party was the ground technician who had been negligent in fueling the aircraft.

* * *

The squadron and regiment which Kulikov once commanded have long since become vanguard performers. He has been promoted. He now has greater responsibilities. But Mikhail Alekseyevich likes a tough job and new problems. He loves his profession, and doing a job one likes always brings joy.



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RESPONSE TO ARTICLE ON PRIMARY DUTY OF SERVICE WIFE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 32-33

[Article, published under the heading "The Reader Continues the Discussion," by V. Bratashova, aviation regiment women's council chairman, and V. Ovsiyenko, garrison officers' club mass cultural activities instructor: "Firm Bond"]

[Text] We read with great interest the article by Viktor and Svetlana Bykov entitled "We Have Common Concerns" (AVIATSIYA I KOSMONAVTIKA, No 5, 1984). We were not the only ones to be moved by this married couple's article. And can one remain indifferent to the important issues dealing with one's daily life which were raised, since the matter in question is the effect of family relations on the job performance of aviation personnel?

One would be hard put to believe that a wife would not wish her husband success in his work, professional advancement, acknowledgment of his accomplishments, and respect by the others in his unit. The issue in question here is evidently something else -- it is the feelings which have dictated this wish. And unfortunately these feelings may not always be unselfish. And do not relations within the family begin here: sincere and well-wishing, or phony, interwoven by a web of mercenary motives? We believe that this should be discussed in a forthright manner, for all to hear, without allowances for petty compassion or fear of insulting somebody or injuring somebody's excessively sensitive vanity.

There is a term "dobroporyadochnost'" [decency]. This quality is essential to both spouses, for otherwise a musty, suffocating atmosphere of philistinism will prevail in a family, an atmosphere capable of killing sprouts of happiness engendered by friendship and love.

They say that at aviation garrisons everybody knows, if not everything, then at least a great deal about everybody else. This may be so, for in the main people have the same interests in life. Nevertheless it sometimes happens that a congenial officer who is respected by everybody suddenly shuts himself off, separates himself from the group, as it were, and makes every effort to be promoted to a higher position. In other words he begins to display strivings of career advancement. There are many factors which give rise to

careerism, and in our opinion one of them is to be found in the family. Frequently wives prepare fertile soil for it to sprout up, even without being aware of it. As a rule envious women do not pass up a single opportunity to say what they think about other officers who in their opinion are less worthy but are advancing more rapidly in their career.

Such conversations are very unpleasant. Quite frankly, such a wife sows seeds of self-interest and selfishness in her spouse's prideful heart. And these seeds sprout bad shoots. Obviously there is no decency in such a family. It does not and cannot contain either goodness or decency. And of course the community should under no circumstances remain indifferent to this.

We are fully in agreement with Viktor Bykov that relations within the family directly affect the husband's performance of his job. One encounters, although rarely, families in which the wife's attitude toward her husband leaves much to be desired, while he nevertheless bravely bears up under the family problems and performs his duty in an exemplary manner. We have encountered such examples. Here is one of them.

He is a flight technical maintenance unit senior technician. He loves his work and prizes military service. After each flight operations shift the command authorities commend this officer and cite him as an example for all personnel. This vanguard performer's picture never disappears from the competition right-flankers display stand, where portraits of excellent-rated individuals in combat and political training are displayed. But at home.... His wife is constantly flying off the handle at her husband at the slightest pretext, even when he comes home tired after flight operations. The same is likely to happen as he is about to leave for the airfield. Her father is a senior officer. And although he is now on reserve status, this woman is quite willing to exploit her father's name for selfish purposes. But he loves his wife and patiently takes everything she dishes out. Svetlana Bykova is unquestionably correct in stating that when you make life hard for a loved one, you inevitably ruin your own life as well.

Another idea presented is also correct -- about a strong sense of responsibility by a girl who marries an officer, particularly a pilot. Indeed, she should understand well that she should consider her signature at the civil registry office as a unique oath of fealty, of willingness to share with her spouse and staunchly to bear all the burdens and hardships of his military service. It is for good reason that we are called service wives [boyevyye podrugi; (female) combat friends]. It is very bad when a young wife all too easily forgets this fact as soon as her husband receives an assignment to a remote garrison.

I recall when a young Komsomol worker received a duty assignment transferring him to our Transbaykal garrison. Soon he received a housing assignment and commenced preparing to welcome his wife. He spent all his evenings free from duty and days off sprucing up their quarters. He phoned her often, frequently wrote letters and sent telegrams. He literally glowed with happiness when he thought about his wife and how she would soon be there. And although her arrival kept being postponed, his enthusiasm did not wane.

Many of the garrison wives, together with their spouses, took active part in helping make ready the quarters for this young couple, donating furniture and household items. In short, everybody was waiting for the young woman's arrival. Finally a telegram arrived, containing the date of arrival and flight number. The commanding officer obtained a car for him from the motor pool. We adorned the room with flowers and prepared a great variety of tasty dishes.

The officer returned from the airfield... alone. He was in an extremely depressed mood. Soon he received a long letter in which his wife argued that it would be inadvisable for her to come.

Here is an example of a different kind. Lyudmila Borodankova graduated from the university in Sverdlovsk and went to work at a television studio. She married. Some time later she was made producer of one of the local programs. She earned the respect and trust of her colleagues, and they respected her professionally. Soon, however, her husband, Military Pilot 1st Class Captain Borodankov, was transferred to a remote garrison. And Lyudmila, without giving it a second thought, went with him. Wherever his military duty called him, she remained at his side and never complained about hardship. She also teaches her children to be faithful to their word and teaches them honesty in all things, raising them to be worthy citizens of our society.

We should note that raising children is an important concern for both spouses. The personal example of the parents is the most powerful means of influencing a child's intellect and psychological makeup. No discussion, argument, or even punishment exerts as graphic and powerful an influence as the behavior of the father and mother. Sincerity or insincerity in their relations cannot be concealed from a child. You can talk to the child until you are blue in the face about honesty, faithfulness to one's word, about good and evil, and he will not take it in if he sees other attitudes at home every day. On the other hand, if a child sees that his mother has a respectful and considerate attitude toward his father and his job, and his father treats his mother in the same way in regard to her concerns, the parents' standard of behavior becomes the child's standard of behavior.

The Bykovs spoke about the beneficial effect of friendship between families on strengthening them, on developing a spirit of comradeship, increased trust, and consequently, on the quality of work connected with preparing for flight operations and carrying out flight assignments. Unquestionably there is a strong direct and feedback linkage in evidence here.

Bonds of friendship and military comradeship strengthen with good and sincere relations between families, between those who take the airplanes up and those who service and maintain them and provide flight operations support services. We believe that the stronger the friendship between pilots and groundcrews, the better the reliability and quality of preparation of combat aircraft, and pilots will fly them with greater confidence that there will be no malfunctions. Is there not apparent here a link with combat readiness and flight operations safety?

We are proud of our garrison and we are pleased that it is getting better year by year, becoming more comfortable and attractive. We are proud that some of the credit for this goes to those who live and work here. These are in the overwhelming majority responsive, hard-working, decent people, firmly bound by friendship, common interests, honor and duty to defend their homeland and its clear, peaceful skies.



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CSO: 9144/478

AUTOMATIC PILOT EJECTION PARACHUTE DEPLOYMENT SYSTEM

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) p 33

[Article, published under the heading "Engendered by Innovative Thinking," by A. Berkutov: "If the Situation Requires"]

[Text] It happened in the 1950's. Pilots were learning to fly a jet fighter. An aircraft appeared above the runway. The roar of its jet engine filled the air. But suddenly a whitish trail appeared behind the aircraft. Then a banging sound was heard and the whistling of a turbine which was losing rpm. Then observers on the ground saw a flame.... One second later the pilot ejected. The ejection seat was blown clear of the aircraft, but... it was too close to the ground for the parachute to deploy.

Engineer I. Amiragov was one of those who observed the incident. He was staggered by the absurdity of what had happened, and he immediately thought to himself: "Can't anything be done to help a pilot in such a situation?"

The engineer came up with the idea of designing a device which would automatically unlatch the straps after ejection according to altitude and airspeed. He proceeded from the position that when a pilot is forced to abandon his aircraft, the parachute system should be actuated differently in different conditions. For example, if a pilot ejects at high altitude and, separating from the ejection seat, the parachute deploys, it will take the pilot a long time to come down. In a combat situation this is dangerous to the ejecting pilot. Would it not be better for the pilot to cover a large part of the distance to the ground together with the ejection seat within a few seconds?

Another peculiarity arose at low altitude: the high dynamic pressure made it impossible to deploy the parachute immediately after ejection. It was necessary to slow speed to a value at which reliable system activation was ensured.

A model of the future device gradually took shape. The engineer reached the conclusion that it was necessary to adjust triggering of parachute deployment in relation to altitude and speed at the moment of ejection.

The invention "Device for Automatic Unlatching of Pilot's Restraining Straps After Ejection" was formally submitted. The engineer was issued a certificate of invention. The device was tested and adopted by the Air Forces under the designation KPA-4. On modern supersonic aircraft automatic parachute ejection systems are dependably saving the lives of flight personnel in emergency situations.



3024
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REASONS FOR AIRCRAFT AGAIN BECOMING AIRBORNE AFTER INITIAL RUNWAY CONTACT EXPLAINED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 34-35

[Article, published under the heading "Practical Aerodynamics for the Pilot," by Military Pilot 1st Class Capt A. Ziziko: "Then the Bounding Will Stop"]

[Text] The aircraft smoothly approached the runway threshold and, rounding out, touched its wheels down on the concrete. The landing seemed normal, with no problems, when suddenly the aircraft lifted off the ground. Again it dropped, and again the aircraft touched down and rose upward. Finally the pilot succeeded in landing the aircraft. After rolling out and taxiing to the ramp, he declared that he had followed correct procedures and that the bounding had not been his fault. Then what caused the aircraft to break contact with the runway?

Some pilots, and even some scientists believe that one of the reasons for an aircraft breaking contact from the runway after landing (with airspeed high on final) may be an increase in DeltaCy, which occurs due to the effect of the proximity of the ground and an increase in flap angles during further decrease in airspeed. This was stated in particular in an article by Maj N. Kurnyavtsev entitled "Bounding Occurred" (AVIATSIYA I KOSMONAVTIKA, No 9, 1983).

We shall attempt to analyze the problem, sequentially answering the following questions: will extension of "floating" flaps, with a decrease in airspeed, cause an increase in aircraft lift, and what moments arise relative to the aircraft's center of gravity when the ground surface is exerting a screening effect on the wing and all-moving tail?

As we know, flaps extend in relation to dynamic pressure q and are maintained in that position by a hydraulic cylinder by constant extension pressure Pg.u=const (Figure 1), which balances the effect of aerodynamic force R on the flap. Equality MzPg.u=MzR is maintained at any flap angle, where MzPg.u is the moment generated by hydraulic system pressure relative to the flap hinge line; MzR -- moment generated by pressure aerodynamic force on the flap relative to its hinge line.

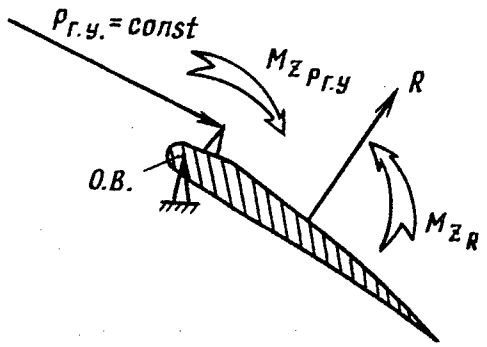


Figure 1. Interaction of forces and moments with extended flap.

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It is evident from Figure 1 that R=const. Consequently, the deflection angle of a "floating" flap is determined to establish some constant quantity R. An increase in this angle will only maintain predetermined R, in spite of a decrease in airspeed, and will slow the rate of decrease in aircraft wing lift but not increase it, because of which, incidentally, as N. Kurnyavtsev stresses in his article, aircraft separation from the runway occurs.

The carrying capacity of the wing and the controllable stabilizer changes as the aircraft approaches the ground surface. A so-called ground "screening" effect occurs. At this moment the actual wing angle of attack increases, while the stabilizer's angle of attack decreases. As a result wing lift increases somewhat, while stabilizer lift diminishes. The closer to the ground, the greater the aircraft's angle of attack and airspeed, the greater this influence becomes.

During landing the "screen" effect is expressed in an increase in the aircraft's negative pitching moment as it approaches the ground. There is an appreciable increase in rearward movement of the controls to bring the aircraft into touchdown attitud. (an additional 2-3 degree forward tilt of the stabilizer). From this one can conclude that with decreasing airspeed, flap extension and ground effect, with no control stick moment, will not cause an increase in lift to such a degree that the aircraft will lift off the runway. In addition, ground effect slows the rate of extension of floating flaps (the principle delta z=f(V) is in operation).

Sink rate at touchdown and G-loading will be determined by the rate of control stick movement at the moment of landing. The greater the error in stabilizer deflection from the specified value, the greater the deviations Vuzad approaches zero and n puzad approaches 1.0, that is, the rougher the landing. A landing at higher airspeed as a rule makes it much more difficult to determine choice of amount and rate of control stick movement.

We analyzed more than 60 landings where the aircraft lifted off the runway, recorded by a monitoring team. Fourteen of these landings involved a load factor of p upos=1.3, 18 -- 1.4, 13 -- 1,5, 7 -- 1.6, 5 -- 1.7, 3 -- 1.8, and 2 -- 1.9.

Analysis of the flight recorder tapes indicated that the landings had been made at a speed exceeding standard landing speed by 10-30 km/h. It is apparent from Figure 3 that all these landings were made with stabilizer deflection angles less than prescribed (phi st pos zad approximately 17-19 degrees), and the greater the error in amount and rate of stabilizer deflection (Figure 2), the rougher the landing.

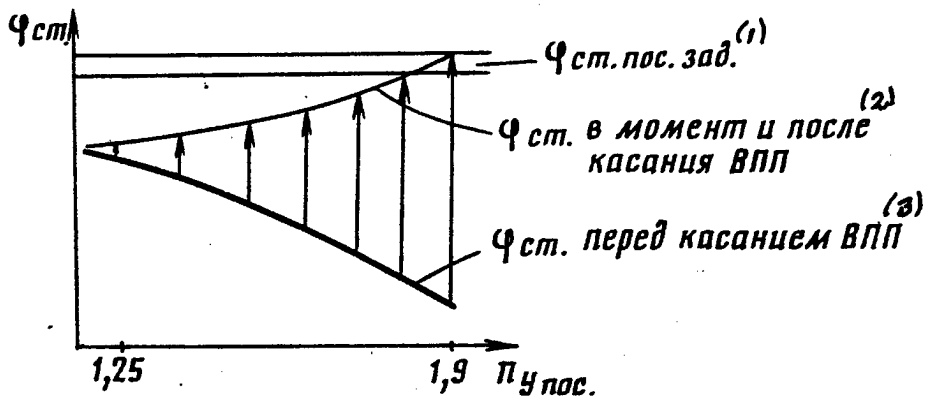


Figure 2. Relationship between p upos and change in phi st during landing and aircraft separation from the runway.

Key: 1. Prescribed stabilizer deflection angle; 2. Stabilizer deflection angle at moment of and after runway contact; 3. Stabilizer deflection angle just prior to runway contact

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Figure 3. Landing an aircraft with various load factors recorded on SARPP flight recorder tapes.

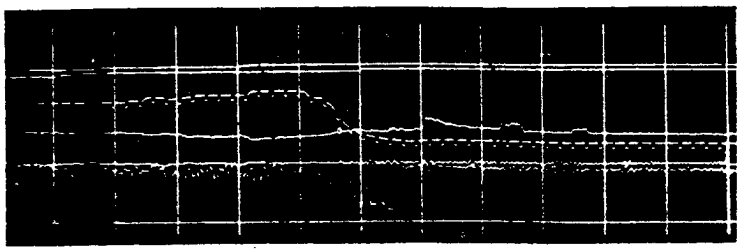
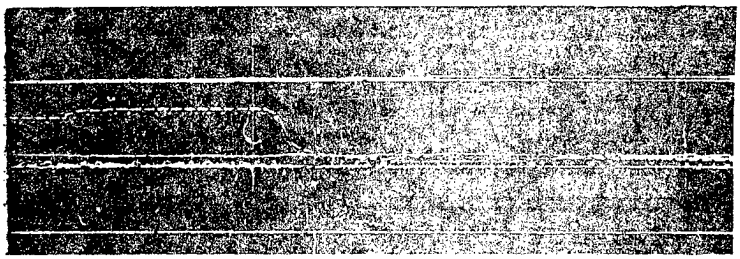
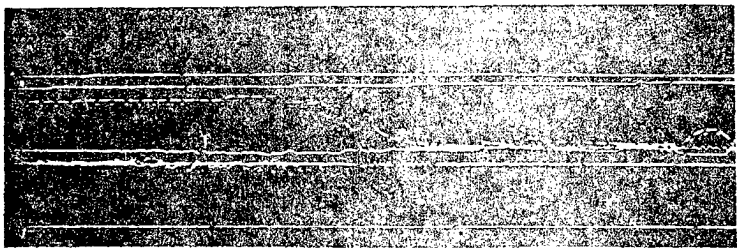


Figure 3 continued from preceding page

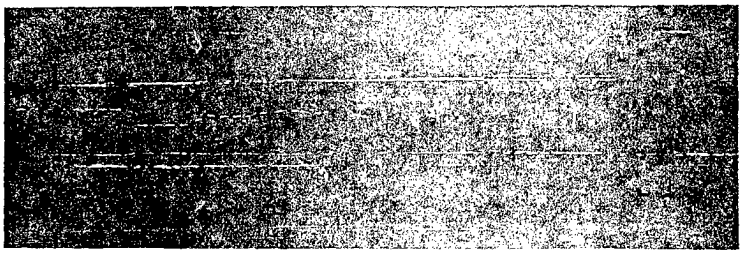
b. $n_{y\ noc}=1,5$ $\varphi_{cr}=12°$



c. $n_{y\ noc}=1,6$ $\varphi_{cr}=7,6°$

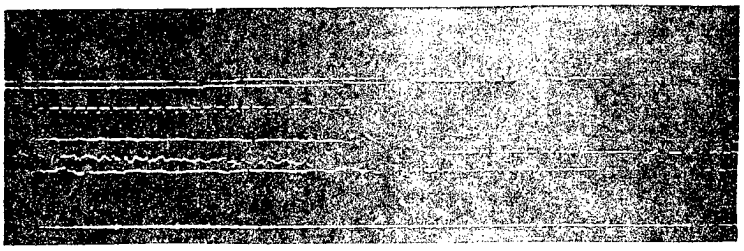


d. $n_{y\ noc}=1,7$ $\varphi_{cr}=13°$



e. $n_{y\ noc}=1,8$ $\varphi_{cr}=6,2°$

f. $n_{y\ noc}=1,9$ $\varphi_{cr}=5°$



For example, in the first landing (Figure 3a) the aircraft touched down at a speed 25 km/h faster than prescribed and with a small stabilizer deflection angle (phi st pos=14.5 degrees). Nevertheless it corresponded to the aircraft's specific landing values V, a, and Vu. But since landing (maintaining principle phi st=f(V, a, Vu) at this speedis somewhat difficult for the pilot, all he had to do was make a small error in moving the control stick, and the aircraft, touching down at p u=1.25, again became airborne. Due to the pilot's subsequent coordinated actions, although the aircraft possessed heightened sensitivity to control stick movements, it stayed down after touching down the second time.

Figure 3c shows a different situation. Just prior to touchdown the pilot moved the control stick forward Delta phi st=4.7 degrees, and then, when the wheels touched down, he pulled the stick rearward by Delta phi st=2.3 degrees, and in addition throttled back abruptly. The aircraft, striking the runway surface with p u=1.6, against became airborne. At the moment of contact separation the pilot pulled back on the stick (instead of holding it steady) by Phi st=19 degrees. Noting that the aircraft was rising rapidly from the runway, he returned the stick to its former position. Subsequently, due to the pilot's unskilled actions, the aircraft broke runway contact three more times, with P u 1=1.7, p u 2=1.6, and p u 3=1.6.

Figure 3d shows particularly clearly incorrect pilot control stick movements during landing. Contributing to aircraft loss of runway contact was not only excessive rearward control stick movement at the moment of touchdown, but also increase in engine rpm. To lift was added engine thrust component P sin a, which amounted to approximately 675-855 kg.

Figure 3f shows the roughest landing. It was caused not only by the factors enumerated above but also by gross errors in flying technique.

Practical experience indicates that in certain cases an aircraft can be landed at elevated speed with small V u pos and p u pos approximately 1.2 without again becoming airborne, if the pilot observes a certain principle in manipulating the controls, corresponding to the specific landing V, a, Vu conditions. But then touchdown will occur in an only slightly nose wheel up attitude. This once again demonstrates that although flap extension does have some effect when reducing airspeed on landing, it is negligibly small and could not lead to such large deviations.

In analyzing bad landings where the aircraft repeatedly touches down and again becomes airborne on the basis of flight recorder tapes, one should devote particular attention to the stabilizer deflection angle track in combination with other parameters recorded on the tape. Without this, conclusions can be incorrect, and steps taken to correct errors will not produce a positive result. In the article we cited there is no phi st record at all in the diagram.



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MI-8 PILOT'S EXPLOITS IN AFGHANISTAN LAUDED, CAREER OUTLINED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 36-37

[Article, published under the heading "They Were Decorated by the Homeland," by Col Ye. Besschetnov: "Gaining Altitude"]

[Text] I met graduate of the Air Force Academy imeni Yu. A. Gagarin, Hero of the Soviet Union Lt Col V. Shcherbakov on a sunny May morning. A pleasant spring rain had fallen the previous evening. Now the rain-washed air was clean and fresh, permeated by the bracing aroma of conifers and blossoming grasses. Strolling through the shady park was a sheer pleasure. We talked about life and military service. I wanted to learn more about this person.

Vasiliy Vasil'yevich's address at a get-together with Air Forces veterans is still fresh in my memory. Famed aviation commanders and air aces from the last war had congregated. Officer Shcherbakov was given the floor. Holding back his emotions, he strode to the podium, a well-proportioned man of military bearing, a Gold Star on his uniform jacket.

"Your exploits, performed in the struggle for the freedom and independence of our homeland," he addressed the veterans, "is for us successors to this combat glory an unfading example to emulate. You can be reassured that the job of guarding the peaceful labor of the Soviet people is in dependable hands!"

His address was received with particular gratification, first and foremost because he himself was the equal of these people who had brought fame to themselves by accomplishing exploits in the name of the homeland. By his valiant military labor this officer had earned the moral right to speak on behalf of his generation with such weight and authority. In a period of peacetime combat training he had earned the lofty title Hero of the Soviet Union.

Party member Lt Col V. Shcherbakov's road to the heights of combat glory was not easy. But if we trace this officer's military career, we shall discover his amazing purposefulness and ability to dedicate himself entirely to attainment of the main goal. This trait was in evidence even before he chose his career.

After completing the 10-year school, Vasiliy secured employment with the Novopolotsk Installation Administration of the Neftezavodmontazh Trust. The lad worked hard and conscientiously and gained good work experience. He mastered the trade of fitter-mechanic. He met shift production targets by 130-140%. He was respected by his fellow workers.

Shcherbakov had a persisting dream of the skies -- he wanted to become a pilot. In the spring he was accepted to membership in the DOSAAF flying sports club. He enthusiastically studied the Mi-1 helicopter and learned to fly. He logged approximately 60 hours in a period of 7 months. But he wanted more! The following year he continued his studies while continuing his employment, logging an additional several dozen hours. At this point Shcherbakov realized once and for all that flying was his calling in life.

Of course service in the Armed Forces opened up the way to serious aviation. Vasiliy submitted a request to the administration of the flying sports club: "I hereby request your assistance... in obtaining acceptance of my volunteer enlistment in the Air Forces. I pledge to serve anywhere in the Soviet Union." In September 1970, upon being commissioned as a junior lieutenant, he reported for duty to an aviation unit in the Central Asian Military District.

Vasiliy's new commanding officer was Maj A. Lunin, commander of a separate helicopter squadron, an outstanding educator and methods specialist. Aleksey Gavrilovich (presently a colonel, holding a high command position), in spite of the fact that he was extremely busy, devoted a great deal of attention to the newcomer's orientation, helping him master the equipment in detail and toughen his character. And the young officer himself displayed diligence and application. In 2 years, enrolled as an external student, he completed the entire curriculum of the Syzran Higher Military Aviation School for Pilots imeni 60th Anniversary of the USSR. Soon he was being viewed as a promising military pilot.

Shcherbakov enjoyed flying the Mi-1, but he hankered to get on a more powerful, sophisticated aircraft. When the opportunity came to transition to the Mi-8 helicopter, he took advantage of it. It is true that he was forced to transfer to a new assignment from a place where he felt at home after his 3 years there.

Subsequently Vasiliy Vasil'yevich on many occasions had kind things to say about the pilots who had shared with him their secrets of skill, who had taught him to pilot a helicopter in high-mountain conditions. The regimental deputy commander, Lt Col A. Timofeyev, devoted a good deal of attention to the aviator's training not only by virtue of his job but also because he saw it as his calling. Aleksandr Ivanovich patiently taught them to land the Mi-8 into and take off out of confined spaces and to fly among the rocky slopes.... Shcherbakov learned many valuable things from him. Everything which he himself learned, he later patiently taught to his own men.

Vasiliy Vasil'yevich and his comrades had occasion to fly various kinds of missions. The aviators not only practiced maneuvers, flew gunnery, bombing, and rocket training sorties to the range, but also helped the virgin-lands farmers during the harvest, assisted the border troops, and rescued mountain

climbers. They also sometimes took part in recovery efforts in the wake of natural disasters.

...Large flocks of sheep numbering in the many thousands had moved as usual to the alpine meadows of the Kara-Say Valley of Kirghizia during warm days in May 1979. And then unexpectedly they were caught in the mountains by a protracted snowfall. The local authorities turned to the helicopter crews for help.

Capt V. Shcherbakov (he was a pilot 1st class and squadron commander by that time) was instructed to lead a group of helicopter crews designated to assist the shepherds. During their years of working together he and copilot-navigator Yu. Lebedev and flight technician Capt V. Gusak had developed into a smoothly-functioning team. Every day, working from dawn to dark, the group flew several difficult missions into the mountains apiece. The pilots hauled provisions for the shepherds and feed for their flocks. On this occasion the know-how Shcherbakov had acquired from Lt Col A. Timofeyev and his other teachers came in particularly handy. They frequently landed onto fresh powder snow and into ill-suited mountain landing sites literally the size of a dime. The situation demanded initiative, ingenuity, and independence in decision-making on the part of the squadron commander. And the commander, filled with a feeling of responsibility for success of the operation, displayed these qualities in full measure. Shcherbakov was truly a virtuoso pilot. Debriefing the pilots after each flight, he shared his know-how with them, noted and cautioned against the slightest errors and mistakes.

Those two weeks were perhaps greater in intensity and, chiefly, in practical results in improving flight proficiency than an entire year of routine training. The helicopter crews succeeded in genuinely honing their skills, which came in very handy later, when giving internationalist assistance to the people of Afghanistan.

Mi-8 helicopters, tasked primarily with hauling supplies, were employed there in full measure. Vasiliy Vasil'yevich well remembers, for example, events connected with delivering supplies to the local populace and the men of an Afghan infantry regiment which was defending the town of Faizabad, situated among outriders of the Hindu Kush Range. In the winter of 1980 the town was in dire straits: the dushman [bandits, rebels] had cut off the roads leading to it, interrupting the flow of food supplies and other necessities to the town. There were people dying of starvation. The only remaining link with the outside world was by air.

"In addition to normal combat training, almost every day we would deliver food to the civilian population, all requisite supplies to the infantry regiment, and would evacuate wounded to a field hospital," recalls Vasiliy Vasil'yevich. "We had worked under difficult conditions in the past, especially in the mountains of Kirghizia. But here everything was much more difficult...."

...A group of 4 Soviet helicopters, led by the most experienced pilots, Majs V. Gaynutdinov and V. Shcherbakov, Capts V. Kopchikov and L. Tuktarev, took off and headed toward Faizabad following a three-day interruption. The weather had been bad all these days. This day as well it was not good. But

they could not delay any longer: the dushman had commenced an attempt to capture the city. The infantry regiment defending it needed ammunition, fuel, and provisions.

The destination airfield, sited in a valley at an elevation of about 1,200 meters, was socked in solid. Cliffs jutted chaotically skyward in every direction. There was no instrument approach capability. The pilots' finely honed skills saved the day. Through a break in the clouds they caught sight of a sparkling ribbon of river below. The road to the airport wound along the river. Losing no time, the helicopters dove into the cloud break one after the other. They succeeded in penetrating through, but the conditions below were not reassuring. The cloud bases extended almost to the very ground, and visibility was 500 meters or less. The river wound its way along a narrow gorge. Cliffs rose up in solid walls close by. If a pilot strayed even a bit to the side, he might strike rock prominences with his rotor blades. Nevertheless the pilots made it through this narrow labyrinth and safely reached the airfield.

The Afghan soldiers were unspeakably happy to see the helicopters. The delivered supplies meant life, and victory! They immediately proceeded to unload the cargo. They rolled out fuel drums and reloaded onto trucks cases of ammunition and sacks of hulled grain, sugar, and flour....

The helicopters then took off one after the other and disappeared into the clouds. They proceeded at minimum forward speed while maintaining maximum rate of climb. The main thing was not to collide with a cliff during penetration of the cloud cover. Finally they broke out on top. The pilots set course for their home field.

Mountain flying is dangerous enough as it is. But here there is in addition the risk of receiving ground fire. The enemies of the revolution were taking vengeance on those who, heeding their internationalist duty, had come to the aid of the toilers of Afghanistan, who had taken power. And sometimes they succeeded in downing helicopters. This fate befell the helicopter flown by squadron deputy commander for political affairs Vladimir Kopchikov. His helicopter came under antiaircraft machinegun fire. Vladimir Fedorovich quickly composed himself and brought the damaged craft down onto the only site which was even vaguely suitable for landing -- into the center of a dushman-captured kishlak [village] way up in the mountains. The leader of this pair, Maj Vasiliy Shcherbakov, seeing that Kopchikov's helicopter was disabled, hastened to the assistance of his fighting comrades. There was a real danger that the crew would fall into the hands of the bandits. The squadron commander continued his descent, also risking being shot down. He touched down close to the crippled craft. Officer V. Kopchikov, his copilot-navigator Sr Lt N. Mokrousov, flight technician Sr Lt V. Rudenko, and a staff officer who happened to be along for the ride, darting behind duval [huts, hovels] which provided cover from the hostile fire, reached Shcherbakov's helicopter in a series of dashes. They had hardly clambered on board when enraged bandits ran out from between some village houses and proceeded to fire a machinegun at them. But they were too late! The helicopter soared skyward and sped off.

Maj V. Shcherbakov and his crew flew a great many difficult, critical missions in the skies of Afghanistan. They got into some extremely difficult situations and were exposed to life-endangering risk. But internationalist duty and the awareness that the Afghan people needed help gave them strength and firmness of spirit. At difficult moments the crew was aided by courage, coolness, enviable self-control, and outstanding flying skill.

On one occasion, while returning to base upon completing a mission, Shcherbakov's crew suddenly found itself under fire by dushman stubbornly holding out in the mountains. They could not turn back -- they were too close to the rocky cliffs. The only thing they could do was to ignore the danger, continue on course, and endeavor to get past the dangerous area as fast as possible. The moment was so tense that neither Shcherbakov himself, nor copilot-navigator Captain Lebedev, nor flight technician Captain Gusak even heard the bullets peppering the craft's skin. Upon inspecting the helicopter after landing they discovered that there were several holes through the reduction gearing housing and the main rotor blades.

On another occasion, while en route over a mountainous area, Maj V. Shcherbakov felt something heavy striking the tail boom. "Take a look and see what it is," he requested his wingman. The latter drew close but was unable to see anything out of the ordinary. Upon returning to their base, when they commenced inspecting the helicopter, they saw that one of the cables extending to the tail rotor had been cut by a projectile, and only a few strands remained of the other. If they had severed completely, the crew would have been in a very difficult situation....

The squadron commander, his deputy commander for political affairs, the party buro secretary and members, in view of the difficult conditions in which the aviation personnel were working, constantly sought to ensure continuity and effectiveness of party-political work. When engaged in intensive flight operations or flying the most critical missions, the party and Komsomol activists in each section would explain the assigned tasks and inspire their fellow soldiers with persuasive word and personal example to carry them out successfully. An atmosphere of good will, a sincere and forthright attitude toward one another, comradely mutual aid and assistance was supported in every possible manner among the squadron's aviation personnel. The men had no hesitation about coming to the commander or political worker to confide what was troubling or bothering them. They knew that they would not get some kind of vague promise but a concrete, practical reply.

Maj V. Shcherbakov's tour of duty with the limited contingent of Soviet forces in Afghanistan became a bright page in his biography. We read in his efficiency report covering that period: "As a squadron commander he demonstrated himself to be a competent, mature preceptor for his men. He enjoys the deserved respect of the command authorities and fellow personnel. He is constantly working to improve the men's combat proficiency and does a great deal of indoctrination work in the squadron...." For successful performance of missions pertaining to rendering internationalist assistance to the people of the DRA as well as for courage and heroism displayed in the performance of duty, Maj V. Shcherbakov was awarded the title Hero of the Soviet Union by ukase of the Presidium of the USSR Supreme Soviet dated 28

April 1980. In August he enrolled in the command faculty at the Red-Banner Order of Kutuzov Air Force Academy imeni Yu. A. Gagarin. Four years have passed. This has been a time of intensive study, deepening and broadening of knowledge of theory, and enrichment of practical experience. During his entire time at the academy Vasiliy Vasil'yevich was a Lenin stipend recipient. He won the All-Union Student Research Project Competition -- the project he submitted was judged the best among the dozens of submissions, winning him a gold medal.

On his preceding line-unit tour of practical training Lt Col V. Shcherbakov performed the duties of regimental chief of staff. He did a brilliant job, displaying his ability to organize and conduct flight operations with precision. His final line-unit training tour was as commander of a helicopter regiment. The performance evaluation commentary by the unit command states that Lieutenant Colonel Shcherbakov is a well-trained pilot and officer-leader. He successfully performed his duties. Overall grade for the line-unit training tour of duty -- excellent.

Lt Col V. Shcherbakov is young. But he has already gone far! This year he graduated from the academy and is reporting to a new duty assignment. This is a man of outstanding flying ability, ideologically and morally fit, and thoroughly trained and prepared. He is in the full bloom of his productive energies and abilities. We are convinced that additional fine accomplishments await him in a noble cause -- serving the homeland.



3024
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BETTER AIRCRAFT MAINTENANCE PERSONNEL PROFICIENCY TRAINING URGED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 38-39

[Article by Gds Capt R. Vaychikauskas: "Strict Demandingness"]

[Text] It is a pleasure to look at a bomber serviced by top proficiency-rated ground maintenance specialist Gds Capt N Zadorozhnyy. For several years in a row now its fuselage has borne the "Excellent Aircraft" emblem. This officer maintains the aircraft, its rampsite and ground equipment in exemplary condition. Taking part in various competitions on numerous occasions, party member Zadorozhnyy has emerged the winner and has been awarded challenge prizes. Last year, for example, he received the highest mark in the review-competition for the best-maintained aircraft flight line position.

Is he perhaps simply lucky, or do the inspecting officers give this officer a break when inspecting the aircraft and checking his technical knowledge? Nothing of the sort! Quite the contrary: we are particularly demanding on vanguard maintenance technicians, and this applies particularly to master proficiency-rating personnel. The engineer-supervisors make every effort to develop efficiency in each and every aviation engineer service specialist and instill in them a feeling of responsibility to increase their technical expertise. Competent maintenance of modern aircraft systems is inconceivable without this. The success of an aircraft's combat employment, as well as proper operation of an aircraft's flight-navigation and other onboard systems in the process of aircrew performance of combat training sorties depends in large measure on aviation engineer service personnel. And if the ground maintenance specialists are competent and conscientious, the achievements accomplished by the aircrews are more substantial.

Gds Capt N. Zadorozhnyy unswervingly observes all the requirements of maintenance procedures as set forth in the appropriate documents and manuals and displays an example of excellent technical competence. He is constantly broadening his knowledge and devotes a great deal of attention to self-education, which helps him improve his professional competence and perform the difficult and critical duties of bomber maintenance technician. This vanguard officer also capably handles the duties of technical maintenance unit chief of a detachment which is among the competition right-flankers.

Experience indicates that the presence of first-class and master proficiency-rated maintenance specialists, genuine experts at their job, in a unit and in aviation squadrons is a reliable guarantee that combat equipment will be maintained at a high degree of readiness for flight operations and for performing missions connected with guaranteeing our nation's security.

In present-day conditions it is particularly important that aircraft maintenance specialists rigorously observe all rules and regulations specified by corresponding orders issued by the USSR minister of defense and the commander in chief of the Air Forces, other guideline documents, possess a high degree of competence in servicing modern aircraft systems, thorough technical knowledge, exceptional efficiency, and a love of their chosen profession. This determines in large measure the coefficients of reliability of aircraft equipment and maintaining aircraft in a continuous state of combat readiness.

Aviation engineer service personnel technical proficiency, solid skills, and a high degree of follow-through in the period of immediate preparations for flight operations and preflighting procedures reduce to a minimum errors in the process of aircraft ground servicing and maintenance. And the higher the proficiency rating of the technician or mechanic, the fewer mistakes he will make and the greater will be his contribution toward ensuring flight safety. It is quite understandable that an aviation engineer service specialist's high proficiency rating confirms his excellent job proficiency, breadth of military-technical knowledge, and ideological maturity.

For many years now I have been acquainted with the chief of an excellent-rated regimental technical maintenance unit aircraft maintenance and repair group, Gds Capt V. Sheydakov, who has a master proficiency rating. His hands are truly golden. He can restore any instrument or device to service and extend their service life. This vanguard officer is an active efficiency innovator. Under his guidance the men reequipped and upgraded the technical maintenance unit's shops and laboratories in their time free from maintenance duties. They have installed a smoothly-operating self-contained power supply system for equipment designed to test aneroid-diaphragm instruments. Party committee member Communist Sheydakov has succeeded in enlisting his men not only in efficiency innovation activities but also in the campaign to boost proficiency ratings and to ensure rigorous observance of technical procedures, rules and regulations.

First and foremost the labor of the specialists 1st class, experts at their job, ensures an increase in the number of excellent-rated aircraft in the squadrons and unit. As a rule such officers and warrant officers produce better results in aircraft preventive maintenance and in checking, testing, and inspecting aircraft systems and equipment.

Here is an example. Specialist 1st Class Gds Sr Lt V. Sanodinskiy is the regiment's leader in socialist competition among technicians. Whatever the status level of a team checking the technical condition of his aircraft, weapons and equipment, it has always awarded the highest mark, for the aircraft officer Sanodinskiy handles is a trainer. The work load on the ground crew is considerable during every flight operations shift. The pilots

who fly this aircraft, however, have never had anything but words of praise for the ground maintenance people.

Last year this aircraft logged more hours than any other aircraft in the regiment. Several additional commendations were added to the service record of this aircraft crewchief. The conscientious labor, persistence, discipline and efficiency of party member Sanodinskiy have repeatedly been cited as an example for all aviation engineer service specialists.

The following questions arise in discussing the professional competence of party member Sanodinskiy and other experienced maintenance specialists: how can one do a faster and better job of training master and high proficiency-rating maintenance personnel, and how can one more efficiently organize their study and preparation for proficiency-rating examinations? These questions constantly occupy the center of attention of the command authorities, methods council, party and Komsomol organizations. Well understanding the importance of boosting proficiency ratings in effective and efficient operation and maintenance of modern aircraft and maintaining aircraft in a continuous state of combat readiness, they are conducting a persistent search to improve methods of training and indoctrinating aviation engineer service personnel, take an interest in their independent study, and aggressively disseminate the know-how of vanguard aviation personnel.

Training of high proficiency-rating ground maintenance personnel is a painstaking and important job. It cannot be allowed to drift. It demands of unit aviation engineer service supervisors a thoughtful approach, initiative, and serious concern for improving all forms of technical training involving aviation engineer service personnel. It is in fact difficult, during the busy period of summer training and intensive flight operations, to arrange for additional training classes for aviation personnel and to hold technical quizzes, question-and-answer evenings on aircraft equipment, and consultation sessions promoting growth in the job skills of maintenance technicians and mechanics. Well-conceived planning of efficient utilization of all the capabilities a unit possesses, however, makes it possible successfully to resolve these matters.

Who of us has not observed the following scene? The time of proficiency-rating tests is approaching, and feverish activity commences. And if to this we add that personnel as a rule take this important examination during the concluding phase of the training year, it will become clear what a difficult time this is, for the men must also be tested on other subjects. And at this point it is fairly difficult for an officer or warrant officer to correct errors.

Practical experience has suggested ways successfully to resolve this problem. It all began with an expanded meeting of the technical section of the unit's methods council. After carefully studying the experience and known-how of the top specialist personnel in the course of exchange of views, we reached the following conclusion: it is essential to formulate a specific program to prepare each officer and warrant officer to take proficiency-rating examinations. Skillfully utilizing synthesized advanced know-how, we first of all specified measures which help officers and warrant officers broaden their

technical knowledgeability and more rapidly master a bomber's complex onboard systems. [Accompanying photograph is of a Tu-95 "Bear" bomber] Classes began to be held more regularly in lecture and technical study groups on the basis of thoroughly thought-out and formulated plan/schedules. Technical conferences, question-and-answer evenings, discussions on military-technical topics, and exchange of advanced know-how by aviation engineer service specialists directly on the flight line became more widely practiced. Each officer drew up a personal plan and schedule for studying aircraft equipment and increasing his military-technical knowledge. Party members regularly present progress reports to the party organization on implementation of this plan, while Komsomol members present reports to the Komsomol committee.

A military-technical lecturing bureau is in operation in the unit. The party organization seeks to achieve effectiveness of dissemination of military-technical knowledge with the assistance of an agitation and propaganda group attached to the party committee, the members of which include the most proficient headquarters staff and aviation engineer service Communists. Discussion of journal articles on military-technical topics is also practiced, and experience and know-how in servicing aircraft in combat-zone conditions and progressive, advanced methods of aircraft servicing and maintenance in present-day conditions are studied.

A stage-by-stage method of training aviation engineer service personnel and forming the required skills in them has also proven effective. The squadron deputy commanders for aviation engineer service, chiefs of detachment technical maintenance units, servicing groups and routine maintenance groups are being stricter in grading the technical proficiency of their men and their proficiency rating. They keep close tabs on how maintenance specialists are improving their job proficiency and how this ultimately affects the quality of aircraft maintenance.

Considerable attention in this unit is devoted to aviation engineer service personnel independent study. We follow an unswerving rule: a maintenance specialist answers to his superior on each training topic in conformity with the ratified schedule, and only after this is he permitted to take proficiency rating examinations.

Squadron aviation engineer service engineers and supervisors play an important role in improving aviation personnel technical knowledge. Of course they need the skilled assistance of the officers from higher headquarters and engineer services. Their advice and recommendations determine in large measure the effectiveness of proficiency in accomplishing individual assignments by maintenance technicians and mechanics pertaining to the aircraft systems and equipment they are studying, as well as the effectiveness of technical briefings and the current relevancy of lectures and reports.

We should like to emphasize that extensive opportunities in this area are opening up for maintenance specialists in the process of aircraft inspections and aircraft maintenance days. Each such get-together between an engineer or maintenance technician and his men around the aircraft is conducive toward a businesslike discussion, a heart-to-heart conversation, and amassing of requisite information for a profound analysis of teaching and indoctrination

process methodology. Unfortunately not all engineers have the ability to utilize such get-togethers effectively for the purpose of training and indoctrinating their men and raising their level of technical competence. I believe that each and every one of us should give serious thought to this.

There are many high proficiency-rating maintenance specialists on the regiment's technical maintenance unit team. The finest officers and warrant officers are initiators of interesting and useful undertakings, which help increase the men's technical and specialized knowledge. The men's technical competence and, consequently, quality of routine maintenance work improves as a result. In the group headed by Gds Capt V. Abramov, who has a master proficiency rating, the specialists 1st class have taken the newer men under their wing. Personnel training has been organized smoothly and at a high methodological level. Supervisors value every minute of training and work aggressively to achieve high stable performance results. Aviation engineer service officers and warrant officers who are high proficiency-rated as a rule possess a mastery of several related occupational specialties. The younger men take them as an example, learn proficiency from them, and work hard to assimilate their advanced know-how. The men of this excellent-rated technical maintenance unit are making a worthy contribution toward maintaining aircraft in a continuous state of combat readiness and ensuring flight safety.

Moral and material incentive measures are effectively employed in our unit to reward aviation personnel who have achieved excellent performance results in socialist competition to earn a higher proficiency rating. Certificates of merit and pennants are awarded in a festive ceremony to the winners when the competition results are totaled up. Performances by the leaders are publicized in news sheets, photo bulletins, in base radio broadcasts, and at flight-technical conferences. Competition right-flankers are given preference in receiving schooling assignments, in receiving better quarters, etc. All this enhances the position of respect enjoyed by high proficiency-rated maintenance specialists and enhances their vanguard role in the campaign to achieve subunits with higher proficiency-rated personnel.

As we see, there are rather considerable possibilities and reserve potential in this area. What is disturbing, however, is the fact that they are not always effectively utilized in practical activities. We might as well admit that we engineers are not sparing of adverse comments, but we do not always find reason or time to praise the labor of a high proficiency-rated maintenance specialist or maintenance technician of an excellent-rated aircraft.

Recently, in the course of various checks and inspections, we have begun approaching in a more demanding manner our assessment of knowledge on the part of aviation engineer service personnel. This year, for example, Gds WO K. Chepik was stripped of his master proficiency rating for serious errors of omission in servicing equipment and for poor efficiency, Gds Capt V. Parkhomenko and Gds WO A. Sukhin were demoted from 1st to 2nd class, and Komsomol member V. Lezin was demoted from 2nd to 3rd class. These disturbing occurrences indicate that we must constantly devote the most serious attention to the indoctrination and training of high proficiency-rating specialists, considering improvement of the professional expertise of aviation engineer

service personnel to be one of the main tasks in further increasing the combat readiness of aircrews and squadrons.



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HELICOPTER STUDENT PILOTS TAUGHT IMPORTANCE OF CONSTANT EXTERNAL VISUAL SCAN

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 40-41

[Article, published under the heading "Military Educational Institution Affairs," by Military Pilot 1st Class Col (Res) A. Yurchenko: "In Order Not to Become a Target"]

[Text] Capt O. Korobintsev was taking a daylight check ride in the practice area with good weather conditions, following a lengthy interruption from flying. He paid a lot of attention to the instruments and not much to external visual scan. The pilot was flying the aircraft with precision, but he was doing ground and horizon reference only sporadically.

The check-ride officer would not authorize the captain to go up with student pilots, for an instructor pilot who is excessively "bound" to his instruments cannot do a good job of teaching them, observing their psychological state and how they are switching their attention and, consequently, will be unable to ensure flight safety and create for his students optimal conditions to accomplish the training assignment.

Captain Korobintsev had additional practice sessions and check rides. After suitable refresher training, he was again cleared for instructor flying.

Observations have shown that some commanders devote insufficient attention to teaching pilots to conduct external visual scan.

Many examples from the Great Patriotic War attest to the fact that a pilot is capable of promptly spotting the adversary and taking an advantageous attack position if he is able to observe the airspace around him in a prompt and timely manner, to scan in a purpuseful way, and to switch his attention correctly and properly. Without this it is impossible to ensure flight safety and successfully to accomplish flight training tasks in modern aircraft.

Matters pertaining to teaching pilots to conduct external visual observation have become at our school the subject of special discussion in methods councils and at conferences in the unit, the flight training (ULO) and flying methods (LMO) sections. The fact is that from their very first steps student pilots would be taught to keep their eyes inside the cockpit, to fly on the

gauges, and would devote little attention to visual flying. Soon we devised a standard methodology and prepared a manual. The experience of the Great Patriotic War and combat training employment of helicopters in present-day conditions, as well as the requirements of guideline documents were used as a reference base. The manual clearly spelled out the duties of instructor pilots pertaining to teaching student pilots to maintain visual observation outside the cockpit, the methodology involved, sequence and procedures to use when flying in various weather conditions.

In preparing this manual we proceeded from the premise that the student pilot is learning continuously. From the very outset he is involved in a complex and fluid system of subordination: after enrolling in service school -- to the platoon and company commander, and subsequently to teachers, instructor pilots, flight commander, and other superiors. In order successfully to teach and indoctrinate a pilot cadet, one must rigorously implement pedagogic principles of unity of views, succession of techniques, and compatibility of methods in one's daily work.

The devised method consisted in the following. Student pilots are taught the necessity of maintaining external visual observation during theory classes and practical training activities, during ground preflight preparation and in the air, in a specific sequence. From the moment a pilot cadet first puts on his air-force uniform, he is taught to observe and analyze phenomena from the standpoint of flying activity, is told what external visual observation is, how it affects flight safety and mission performance, and is explained the principles of its conduct. When a pilot cadet commences training in the flight training section, he is taught to maintain external visual observation both before and after entering the helicopter cockpit, before and after starting the engines, before taxiing and after completing a flight. During general training he works to reinforce previously acquired skills and habits of maintaining external visual scan during taxiing and in the air while practicing in the pattern, and subsequently when performing other maneuvers.

It is noteworthy that instructor personnel sought to create for the future pilots conditions in which they not only would commit to memory the axioms of maintaining vigilant external visual observation but also would understand their necessity, significance, and procedure: how, when, and where to conduct such visual scan. Display stands bearing the rules, regulations, and procedures of external visual scan were placed for this purpose in the barracks compound area, at the airfield, in the simulator training areas, in the classrooms, and the school's departmental areas. Thus they were constantly there for the pilot cadets to see. In addition, instructive classes on methods of teaching future pilots to maintain external visual observation were conducted for the officers of the cadet subunits, faculty members and instructors.

At the first stage primarily the platoon commander works with the cadets. He teaches them to scan in a specific pattern. During this same period the young men are assigned to flying groups. The instructor pilots, in addition to performing their primary duties, explain to them what external visual scan is, its purpose and significance, and also explain how to develop the requisite skills and habits. Cadets learn to see, hear, notice, and analyze the

environment and situation around them. They develop an awareness of the fact that visual scan is one of the most important elements in flying activity, that they themselves are responsible for its conduct, and that it plays an enormous role for the helicopter pilot, since a pilot who has not observant is a good target for the enemy.

School faculty members become actively involved in the training and indoctrination process when the cadets move on to the flight training section. They draw the students' attention to the importance of visual scan and cite positive and negative examples applicable to tactics, air navigation, and other subjects.

After several months in the flight training section, the cadet commences training activities at special sites for starting up engines and performing runup checks. During these practice sessions they simultaneously work on following visual scan procedures during preparation for starting engines, during starting, during taxi out and back, before and after shutting down engines. Thus even before they head for the airfield, cadets know what external visual scan is and understand its purpose and significance. They develop constant alertness and personal responsibility for it.

While studying the techniques of executing flight maneuver assignments and attention distribution, student pilots at the same time assimilate the rules and procedures, sequence and methods of maintaining external visual scan by stages. For example, a height of 50-70 meters, the beginning and end of each turn in the pattern will be these stages during the first dual flights around the pattern. Subsequently the instructor adds scan by sectors, directions, and zones, taking into consideration the developing air situation.

Ground training as a rule ends with practice sessions in the helicopter cockpits. At this stage pilot cadets should not be made to hone on the ground skills they should practice in the air, since conditions differ greatly from actual conditions in the air, and they gain an erroneous notion about external visual scan during flight.

During immediate preparation the future pilots prepare specifically for the flight operations day and become aware that the detailed sequence and modes of observation will depend on flight conditions and that sequence and modes of observation also change with a change in flight conditions. It is very important in the process of running through a flight assignment in advance to see that the student pilots demonstrate in a practical manner how it is essential to observe and evaluate the air, ground, and weather situation, and at the same time point to the most probable direction of appearance of other helicopters. For this, procedures are organized in such a manner that they are able to observe taxiing and flying helicopters, visually to determine distance to them and height, and listen to radio communications.

Visual observation training on the ground does not present any particular difficulties. In the air, however, student pilots encounter unaccustomed conditions, which engenders constrained responses and retarded reactions to a certain degree. Therefore during initial flights the instructor should remind his students of the need continuously to conduct external visual scan,

subsequently being rigidly demanding on this point. If students do a poor job with external observation, their training flights should be suspended, and they should be given appropriate remedial training.

In proceeding with teaching the conduct of external visual observation in the air, the instructor follows the following rule: a practice drill improving external observation should correspond to each piloting technique practice activity. The simplest and most easily assimilated visual scan pattern is the "figure eight" -- a circular scan of airspace, running high to low and left to right. During the initial dual-instruction flights around the pattern, with the instructor regularly reminding the student to scan the surrounding airspace, the pilot cadet not only works on mastering visual scanning procedure but also commits to memory where he should conduct visual scan. Subsequently, in contrast to the earlier stage of training, primary emphasis is based on student pilot independent analysis of the air and ground situation, where the instructor checks and guides his actions.

As practical experience has shown, increasing demandingness on future pilots when flying at various speeds and altitudes in various weather conditions cannot totally guarantee flight safety when employing only the "figure eight" scan. The fact is that the pilot cadet must picture the situation around him from takeoff to taxi back to the ramp, that is, he should "see" in his mind's eye not only visually observable aircraft but also those which may unexpectedly appear in his field of vision. In addition, today it is no longer sufficient to spot a helicopter or fixed-wing aircraft and determine its course. One must determine the aircraft type, its approximate speed and likely intentions and, with continued observation, to establish whether the first assumption was correct.

After he is back on the ground the student pilot reports to his instructor during what phase, at what range, at what height or altitude, and at what aspect he spotted helicopters, fixed-wing aircraft, their type, how many, in what direction they were flying, how they affected mission performance, and what measures he took upon spotting them.

During his analysis, the instructor evaluates the quality of observational performance by the student and specifies way to correct noted deficiencies.

Experience indicates that methodological preparation on the part of command personnel in training future pilots and no-nonsense response to violations of rules and procedures bring an end to mishap-threatening incidents caused by poor visual attention on the part of flight personnel.



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AIRCRAFT OVERHAUL DEPOT SEEKS TO IMPROVE OPERATIONS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 42-43

[Article, published under the heading "Marching in the Vanguard," by Col V. Lebedev: "Thorough Search"]

[Text] I had heard many good things about Col I. Rybin. Ivan Fedorovich is head of a vanguard Air Forces aviation enterprise. Recently he was awarded the Badge of Honor, and earlier his military labor had been honored by the Order of Service to the Homeland in the USSR Armed Forces, Third Class. I wanted to get to know this individual better, to learn how he directs a large workforce and achieves stable, high performance figures.

I arrived at the enterprise somewhat early, in hopes of speaking with party member Rybin before the workshift began, before he was inundated by the thousand concerns of the normal workday. He was not in his office, however: Ivan Fedorovich had left to see the construction people about an hour before.

"Wait for him at the party committee," I was advised.

Party committee member Viktor Nikolayevich Lazarevich told me about the history of the enterprise and the people working there.

The biography of this aircraft repair and overhaul enterprise began from the first days of the Great Patriotic War. Its workforce labored selflessly, restoring damaged aircraft to service. Repaired aircraft went from here first to the Western Front and subsequently to Stalingrad. Flying them into the flaming skies of the war, our pilots boldly pummeled the enemy. The homeland awarded the enterprise the Order of the Red Star for its great contribution to the war effort against the fascist invaders.

"What about the present generation?" I asked Viktor Nikolayevich.

"Our people possess a deep awareness of their duty and feel a personal responsibility for the quality of aircraft repair and overhaul. Everybody measures his performance against the veterans and endeavors to continue in a worthy manner the traditions of the older generations," replied officer V. Lazarevich.

The heirs and successors to the fighting and labor fame remember and are familiar with today, almost 40 years later, the deeds of those who repaired and rebuilt aircraft under heavy enemy fire. The workforce of this vanguard enterprise is striving persistently toward fulfillment and overfulfillment of shift targets and is seeking to achieve high quality of aircraft repair and overhaul. Their labor has been duly commended by the command authorities. Challenge Red Banners, Certificates of Merit, prizes, and other awards occupy a place of honor in the combat and labor glory rooms. Incidentally, various displays and documents showing the enterprise's multifaceted activities and its glorious history have also been assembled here.

"This is the third year in a row we have been awarded a challenge Red Banner of the CPSU Central Committee, USSR Council of Ministers, All-Union Central Trade Union Council, and All-Union Komsomol Central Committee, with our name entered on the Honor Board at the Exhibition of Achievements of the USSR National Economy," party member V. Lazarevich related with pride. "And a good deal of the credit for the workforce's success goes to Colonel Rybin."

Soon I met Ivan Fedorovich face to face. His open countenance and welcoming gaze created at the outset an atmosphere conducive to a frank and open conversation. In spite of his busy schedule, he willingly consented to an interview. It was clearly apparent that he knew his plant well, had a clear picture of its potential for the future, and also was aware of unresolved problems. This officer spoke with pleasure about the achievements of his subordinates, and he wanted others to learn of them as well.

This person has never sought an easy life. He was born in the rich agricultural area of Voronezh Oblast, in a family of grain farmers. But he was fated not to experience the unique pleasure of youth: he was not yet 15 when the war began. And in 1943 Ivan Rybin marched off to defend the homeland. He was exposed to many hardships, but they were unable to defeat him.

He has been in the military for more than 4 decades now. After graduating from aviation technical school he serviced aircraft radios. Service in an aviation regiment demands a full effort. He worked hard at his job, and he was rewarded accordingly. He was a shop superintendent, and subsequently headed the power and engineering section and the production section. He continuously worked to broaden his technical knowledgeability and further his knowledge. In 1962 he received a polytechnic institute diploma. A few years later Ivan Fedorovich was assigned to head an aircraft repair and overhaul enterprise.

His new position brought with it a great many responsibilities. On his shoulders rested great responsibility for the affairs of the workforce, quality of repair and overhaul of aircraft, and meeting of production targets. Perhaps the best thing for him would have been to remain in his previous job, where he was intimately familiar with all aspects. But this individual's character is such that he is impelled to accept a heavier burden, to address

difficulties without sidestepping, and to endeavor to realize his abilities as fully as possible in a key sector. And he unhesitatingly agreed to head the aircraft repair and overhaul enterprise.

In his new job, true to his principles, Ivan Fedorovich proceeded to investigate and learn everything in great depth and thoroughness. First of all he thoroughly studied the state of affairs. The shops and laboratories contained complex equipment. They provided the capability to ensure high quality of repair and overhaul. And most of the employees were well aware of their assigned tasks and cognizant of their personal responsibility for accomplishing these tasks. But there were also those who lacked enthusiasm. Party member Rybin, convinced that the success of any undertaking is determined by the people involved, and working in skillful coordination with the party, trade union, and Komsomol organizations, seriously addressed the matter of teaching and indoctrinating his subordinates from the very outset.

Ivan Fedorovich has the ability to rely on the collective intelligence and practical wisdom of the veteran workers. He always pays close heed to their recommendations. He thinks everything through carefully, analyzes, discusses matters with his closest aides, and only after this does he make a decision. As a rule it is the most optimal, precisely checked decision. With flexible, sensible interaction with his assistants and the activists, and with a precise and smooth work rhythm, the enterprise head succeeds in maintaining in the workforce a high degree of labor enthusiasm and in skillfully guiding the activities of the various sections and strengthening the moral-ethical climate. The people he leads work with a great deal of enthusiasm and inspiration.

But the scale of the problems being tackled by Col I. Rybin is extremely large. He, the enterprise head, must think every day not only about production matters, which determine the prompt return of aircraft to service, but also about the enterprise's future, the adoption of modern technology, boosting the workers' level of skills, their indoctrination, and meeting their basic services needs. In totaling up competition results for a month, 3 months, or 6 months, one must weigh all factors in order correctly to utilize material and moral incentives to encourage and reward vanguard performers.

"Fairness and firmness in distribution of funds allocated to reward outstanding performers," stated Ivan Fedorovich, "is one of the important ways to boost labor productivity and achieve further development of people's creative initiative."

Initiative plays an important role in the fact that the enterprise has gained the reputation of being one of the finest aircraft repair and overhaul organizations in the Air Forces. We are talking about initiative not only on the part of management, the party committee, the trade union committee and Komsomol committee, but on the part of all workers as well. We must give due credit to party committee members A. Gavrilyuk, V. Yeremenko, V. Baskakov, V. Lazarevich, S. Sokolov, and others, who are giving I. Rybin strong support in handling matters large and small.

The people at this enterprise approach with all seriousness the question of

publicizing the experience and know-how of vanguard workers. They have put together a "Book of Popular Fame," in which are recorded the best sections and brigades and the names of socialist competition winners, shock-workers of Communist labor, war and labor veterans. The book contains brief entries describing their experience and know-how and the outstanding initiatives by innovators.

The brigade headed by party member A. Solov'yev enjoys a good reputation.

"Aleksandr Ivanovich is a hard-working specialist with initiative," I was told at the party committee. "For many years now his brigade has been doing a quality job of repairing and overhauling aircraft equipment. It has been awarded the title of Communist labor brigade. And the brigade leader is a member of the party committee."

Lt I. Rybin had good things to say about party member S. Kalashnikov's brigade.

"Stanislav Alekseyevich is respected by his fellow workers," he stressed. "The team of assembler-riveters he heads is a competition leader. For a long time now they have had no violations of labor or process discipline. The brigade has been named the best among Air Forces aircraft and overhaul enterprises and has been awarded an Honorary Pennant of the USSR Ministry of Defense and Central Committee of the Trade Union of Aviation Workers."

Everybody I talked with characterized Col I. Rybin as a thoughtful and capable leader of initiative. He is strict and firm, but at the same time fair and just in appraising the labor of his subordinates, has consideration for others, and knows well the people's needs and aspirations.

It is not easy to maintain the enterprise's title as one of the best. They cannot simply rest on their laurels. They gave thought to the matter and decided to implement an aggregate of measures to improve working conditions and the quality of labor. A large construction project was undertaken at party member Rybin's initiative. They succeeded in renovating shops handling the repair and overhaul of equipment, overhaul and refurbishing of avionics and nonstandard equipment, their flight testing facility, and other industrial installations. Two nicely-appointed apartment buildings were erected, containing 172 units. Priority in apartment assignments was given to vanguard workers who had worked at the enterprise for at least 10 years. This tradition is continuing, which helps boost labor discipline and keep skilled workers from looking for employment elsewhere.

"We have drawn up measures for this enterprise's future development," stated Ivan Fedorovich. "We are planning to bring on-stream an electroplating shop with neutralization stations, an aircraft shop, a garage zone with ancillary facilities for garaging specialized trucks. This year we are planning to bring into operation an aircraft equipment rebuilding shop."

Listening to Colonel Rybin, one gains a picture of the full scope of socioeconomic transformations which are taking place at the enterprise during

the current five-year plan. Scheduled facilities are coming on-stream on timetable, and the pace of aircraft repair and overhaul operations is not slackening off.

For several years now the workforce has been taking part in competition for the title of exemplary enterprise. Orderly procedure is maintained in the shops and sections, and a high degree of technical proficiency and an attractive workplace are being provided in all areas. Everybody was aware of the importance of the changes and realized their promise and significance. Therefore they sought to achieve exemplary order in a highly enthusiastic manner. As a result the enterprise's countenance became literally transformed, and people grew spiritually and intellectually. The workforce passed the rigorous tests with flying colors. The enterprise was awarded the title of exemplary.

Now the people here are even stricter about quality of labor and treat more severely those who violate discipline or perform shoddy work. Permanently operating production conferences set up at the initiative of the party committee are doing a great deal of work in this area.

"A very effective body," offered by Rybin. "It includes labor veterans, production leaders, party and Komsomol activists. They hold individuals accountable for errors of omission and mistakes regardless of rank or past accomplishments."

They now approach determination of competition results in a more exacting manner. They take into consideration first and foremost basic indices: coefficient of quality, smoothness of production pace, labor productivity growth, decrease in production cost, and economy in funds and materials. An important role is played by skilled utilization of payroll and material incentive rewards, as well as labor forming indices.

"Here," I was told at the party committee, "we take into consideration the state of labor and social discipline, participation in mass political activities, sports and amateur entertainment activities."

There is a high level of sophistication of production at the enterprise, and fine experts at their job have developed. For example, the title "Air Forces Best in Occupational Category" was awarded to experienced specialists K. Artyukh and Pozdnyakov. The workforce of the shop headed by party committee member Viktor Konstantinovich Pivovarchik also works selflessly, overhauling and rebuilding equipment. This year it has been a repeated competition winner. The overhaul enterprise workers speak proudly of Maj V. Yeremenkov. Vladimir Ivanovich is a conscientious, knowledgeable engineer and man of initiative. He does a great deal of work on bringing new industrial processes on line and performance of aircraft repairs on the basis of condition. Other top specialists include party members Lt Col A. Gavrilyuk and Capt A. Sadovoy. They have proven to be skilled organizers and indoctrinators. They have made a weighty contribution toward the workforce's achievements.

A veterans' council is functioning at the enterprise. It does a great deal of work in the area of publicizing labor and combat traditions as well as

advanced know-how. A "relay book" devoted to the 40th anniversary of victory in the Great Patriotic War has been established. It contains photographs of war veterans and relates their military exploits during the terrible war years as well as their present-day accomplishments. A message of greeting to the repair and overhaul enterprise workers from the commander in chief of the Air Forces, Chief Mar Avn P. S. Kutakhov, is on display in the combat glory room. He gives high praise to their labor.

This year the enterprise is faced with difficult tasks. This means new problems and new concerns. A lively discussion was held on this subject at the most recent party committee session and at a party meeting, where a report was presented by Col I. Rybin. Party members thoroughly analyzed unutilized capabilities and reserve potential and specified specific measures. A great deal depends on the cohesiveness of the workforce and their attitude toward the task at hand. The aircraft repair and overhaul workers consider profound search and selfless labor to be the road to new achievements in accomplishing their tasks -- extending the service life of modern aircraft and returning them to line-unit service.



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STATUS OF SATELLITE COMMUNICATIONS REVIEWED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 84 (signed to press 5 Jul 84) pp 44-45

[Article, published under the heading "Space Program in the Socialist Countries," by G. Sapov: "Satellite Communications Today and Tomorrow"]

[Text] Approximately 70 satellite communications systems are currently in operation worldwide. They include three international (Intersputnik, Intelsat, and Inmarsat), three regional, and more than 60 national systems.

Soviet communications satellites form the basis of the international Intersputnik system, the membership of which includes the Hungarian People's Republic, GDR, Democratic People's Republic of Korea, Laos, Mongolian People's Republic, People's Republic of Bulgaria, People's Democratic Republic of Yemen, Polish People's Republic, Republic of Cuba, Socialist Republic of Vietnam, Socialist Republic of Romania, USSR, and the Czechoslovak Socialist Republic. This system's network of stations is also extensively utilized by the Democratic and Popular Republic of Algeria, Iraq, Spain, and France. It provides regular exchange of television programming, telephonic and telegraphic communications among the countries of Europe, Asia, Africa, and the Americas. The Intervision [Intervideniye] TV News Service, which provides the opportunity to become acquainted with the life and affairs of the peoples of the brother socialist countries, is also distributed via this system.

According to predictions by UN experts, by the year 2000 satellite communications systems will handle one fourth of the total volume of telephone communications and half of television and digital data transmissions. Experts maintain that space communications will be evolving, first of all, by improving and perfecting the satellite relay unit and by adding new frequency bands, which will make it possible to increase the traffic capacity of satellites; secondly, by adoption of new methods of multistation access in combination with promising future signal processing modes. And, finally, further development is possible through the construction of ground stations and launching standby satellites of currently operating models. Since this latter growth area requires considerable capital investment in ground facilities and possesses limits regarding utilization of a geostationary orbit, development of the first two areas of development is preferable. This

is confirmed by satellite communication network operation results in various countries.

The repeater unit is improved by employing multi-wire antennas, onboard signal processing, and improving linearity of amplifier-converter devices.

Multi-wire antennas make it possible to increase efficiency of power and frequency band utilization with the aid of spatial and polarization signal separation. With high antenna gains it is possible to reduce the cost of ground stations at key points in communication networks, located at the centers of narrow beams. For the USSR national network, for example, in the 4-6 gigahertz band one can employ a single beam covering practically the entire country, and two beams for zonal communications: in the European part of the country and Eastern Siberia. This approach will make it possible to simplify ground stations. Bulky 12-meter dishes can be replaced with simple 7-meter dish container-size stations.

There are two methods of interest among methods of onboard signal processing. Each has its advantages. Demodulation of earth-satellite link digital signals and regeneration with subsequent transmission to receiving stations, for example, provides the possibility of improving radio channel characteristics and, with identical earth-satellite and satellite-earth link energy potentials, provides an improvement by a magnitude of two in comparison with a linear repeater with identical probability of error at ground station output.

The second method involves active switching for distribution of various receiving link signals among corresponding amplifiers and transmission link antennas. In a multistation access network with highly-directional or scanning satelliteborne antennas, it makes it possible substantially to increase efficiency of satellite frequency and power utilization (in comparison, for example, with frequency methods of signal separation). A computer-controlled switching matrix and onboard scanning antennas provide connection in a preselected sequence of narrow zones 250 kilometers in diameter, where ground receiving stations are located, as well as instantaneous switching. These repeaters increase radio link energy potential utilization by a magnitude of tens of times.

Improvement of repeater linearity not only opens up extensive possibilities for satellite improvement but also increases the traffic capacity of presently-existing satellite communications networks. A high degree of linearity is achieved with the aid of solid-state onboard amplifiers with nonlinearity compensators. Installation of such equipment will make it possible to increase the traffic capacity of satellite networks by a factor of 5-7.

The degree of advance represented by these engineering innovations is characterized by such an indicator as number of channels per kilogram of space vehicle mass. In today's satellite it is running 30-50 channels per kilogram.

We should note that development of satellite communications digital equipment, increasing the energy potential of satellite links (narrow beams, onboard switching), utilization of new frequency bands, employment of modern signal

processing methods, and advances in microelectronics are leading to a decrease in the cost of satellite communications channels.

Space communications possesses great potential, and each year it is offering man new kinds of services. Until quite recently, for example, data transmission employing stations with dishes up to 2 meters in diameter was a thing of the future. But today they are being connected directly to factory and officer computer systems. The Dubna International Satellite Communications Center (USSR) and the National Research Center at Neuholm (GDR) are connected via an Intersputnik system data link, and centers in Czechoslovakia, Hungary, Bulgaria, and Poland will soon be hooked up to the network.

Experimental data transmissions between Moscow and Havana were performed last year. The following took part in these dialogues via space: from Moscow -- people at the CEMA member nations scientific and technical information center, and from Havana -- specialists at the Academy of Sciences of the Republic of Cuba.

Video teleconferencing is another new type of service. A total of 80,000 teleconferences took place in 1981. This year about a million are planned. These will be TV presentations (demonstration of new equipment, reports from exhibits and scientific laboratories) and teleconferences, with dialogues conducted via duplex TV channel, with discussion of issues in various domains of human activity. Major hotels and conference centers in many countries throughout the world are already set up with teleconferencing hardware, which will make it possible to hold scientific symposia and conferences without participants actually traveling to the conference site.

International division of labor plays a major role in the advance of space technology. A vivid example of such cooperation is projects involved in the Interkosmos program. Scientists and specialists from the socialist countries are uniting efforts for theoretical research and further improvement of satellite communications and TV broadcasting equipment and technology. Establishment in the Moscow Oblast town of Dubna of an experimental joint projects section by the nations participating in the Interkosmos program was an important milestone in cooperation. For example, a repeater and transceiver station operating in the 11-14 gigahertz band were developed for it in the USSR, GDR scientists developed a method of experiment data processing, Czechoslovak scientists designed and built a station with a 3-meter dish, while Bulgaria, Hungary, and Poland furnished telemetry link equipment.

Of course the potential capabilities of satellite communications are not exhausted with the above enumeration. The cited facts merely show that practical accomplishments are not only in conformity with the boldest predictions by the scientists, predictions which only yesterday seemed unattainable, but are even surpassing them.


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SPACE PROGRAM MISSION CONTROLLER PROFILED

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[Article, published under the heading "Into Competition," by V. Slavyantsev: "Ground Workers of Space"]

[Text] The gloom of night held the city firmly in its grasp, reluctant to retreat before the advancing dawn. The streets, washed by a recent rain, gleamed in the beams cast by automobile headlights. Zhigulis dashed through the streets, noisily splashing through rain puddles.

Georgiy Oganesyants rarely drives alone -- he almost always has riders. This time was no exception. He steered with a light and confident grasp of the wheel, as if he were not just coming off a tough work shift, which had lasted almost 24 hours.

Georgiy Sarkisovich is in charge of developing an orbital station flight program, that is, he works for tomorrow. Current events would seem not to concern him, but nevertheless he is always present at Mission Control Center during all critical phases of a mission.

"We do not influence current events," stated Oganesyants. "They are controlled by the duty shift, headed by the duty mission controller. But they are carrying out a program we developed. This is our examination. The pluses and minuses of our work show up here, and we learn to do the job better."

I have known Oganesyants since college. I cannot recall him ever looking depressed or dispirited. His optimism would seem to be an inborn quality.

I recall the virgin lands. We were there when the romance of a pioneering venture had abated, while the student construction detachments had not yet gathered momentum. It is amazing when you think about it today. How could it be that we college students, lacking skills in the construction trades, traveled way out there to build agricultural facilities, housing, and nursery schools? But we were filled with enthusiasm and the burning desire to be useful. And we accomplished our job, mastering what for us were new trades.

Georgiy Oganesyants worked like all the others: not where he wanted to work, but where he was needed. No matter how hard the work was, his eyes always contained a lively gleam and his voice sounded a cheerful note.

That was more than 20 years ago. Georgiy Sarkisovich is working in the space program. Could his life have turned out differently? No question about it. He was born in Donetsk, in the family of a mining engineer. At the time he gave no serious thought to the possibility that he might be directly involved in exploration of space. The launchings of the first artificial earth satellite seemed to be the far edge of the attainable. They evoked merely delight, but seemed unable to influence the career choice made by a 15-year-old. Georgiy wanted to become an engineer. He enrolled in the Moscow Aviation Institute, where students were taught to design aircraft which seemed to be the embodiment of technological perfection. In addition, aviation was steeped in the romance of numerous peacetime and wartime exploits.

The students at MAI [Moscow Aviation Institute], just like everybody else, were pleased at man's first flight into space. But the fact that the first cosmonaut was directly linked to aviation, that is, was a pilot, entitled them, as they saw it, to rejoice more than others. It was perhaps at that time that Georgiy Oganesyants first gave thought to the possibility of involvement in the space program. But many people were dreaming about this at the time.

Fate smiled on this young specialist. Upon graduation from the institute he was assigned to the design office headed by Academician S. P. Korolev. Upon reporting to his new job he had to undergo a personal interview -- a kind of examination covering a broad range of topics. And the examiners were future cosmonaut Vitaliy Sevast'yanov and Hero of the Soviet Union Konstantin Feoktistov, who had already flown in space. The interview was a success.

"You will be working in Makarov's group," Oganesyants was told.

A year later Oleg Makarov was accepted into the cosmonaut program, and he was replaced by Viktor Blagov. This person's name is known to everybody working in the space program. Advancing up all the rungs of the ladder in spacecraft and orbital station mission control, he became deputy mission controller.

Georgiy Oganesyants took part initially in unmanned space vehicle and subsequently manned spacecraft mission control. He worked at tracking stations, on USSR Academy of Sciences ships, and served as a control team supervisor. In 1974 he was made a shift mission controller. His first operation in this position was providing mission control for the Soyuz 14, which transported Pavel Popovich and Yuriy Artyukhin to the Salyut 3 station.

Control and management of a space flight is a complex technological process involving the participation of thousands of persons and a large amount of equipment. Everything must work smoothly and precisely. This is achieved by means of thorough, painstaking preparation. When one becomes acquainted with the personnel at Mission Control Center, one immediately notes that this is a carefully selected and thoroughly trained workforce. It consists of specialists in various fields. Some handle the flight program and organize

flight control and management, while others handle onboard systems. You will see here design engineers, scientists, ballisticians, specialists in the field of medicine, and communications specialists. There are also specialists in tracking station operation and operation and maintenance of mission control center equipment, as well as representatives of scientific organizations. And this enormous workforce is headed by the mission controller.

Oganesyants learned the complex and diversified science of space flight control and management under the direction of twice Hero of the Soviet Union Pilot-Cosmonaut USSR Aleksey Yeliseyev. Georgiy has always been fortunate in having good teachers. Calm, a man who does not waste words, Yeliseyev is an example for many. A highly-skilled specialist possessing an exceptional sensitivity of perception, he would instantly find the right solution in various situations. To the outsider it might seem that the mission controller is having a routine conversation with the crew about a mission program variation which had been thoroughly rehearsed at mission training sessions. If somebody was excessively casual or careless in his work performance, Yeliseyev would not noisily dress him down. He would talk in an even tone of voice, without humiliating the individual involved, but the guilty party would feel terribly ashamed of his negligent actions.

It is an honor and a privilege to become his assistant and shift mission controller. But this individual bears a heavy burden of responsibility. It is not enough for him thoroughly to study and master all components of the control operation and their interaction.

"You bear personal responsibility for the progress of the mission throughout your entire duty shift," Yeliseyev instructed Oganesyants. "And you must ensure precise interaction on the part of all mission control support services, as well as between ground and spacecraft crew."

At present every hour in orbit is a matter of considerable cost. This is why the mission control people endeavor to increase the spacecraft crew's work efficiency. An entire aggregate of measures to provide psychological support of the crew has been devised for good reason. Its purpose is to diminish the effect of negative emotions on the cosmonauts' work performance. A psychological support service was formed back during the Salyut 6 station manned missions.

Picture the following situation. A communications session is in progress. The cosmonauts are performing research tasks. They have undergone appropriate training and preparation. But can they be called professionals across the entire diversified range of mission tasks? Of course not. Therefore quite naturally questions arise on the part of the crew. Sometimes a single verbal report from orbit is not enough for experts in the subject to give an answer to these questions. The correct conclusions cannot always be reached immediately. It takes time, and sometimes they must examine and digest telemetry data.

"We'll have an answer next time around," the cap com informs the crew.

Sometimes a second and third question evoke the same response. Naturally the cosmonauts are displeased. And this displeasure can easily build into testiness.

Suddenly the voice of the shift mission controller comes on the air. In these situations he does not give his callsign but immediately enters the conversation. He does not make a big deal of it: some remark, a witticism, or perhaps a serious comment.... Subsequently it is even hard to remember what he said. The main thing, however, is that work continues calmly and smoothly. Thus we see that the shift mission controller must, in addition to all else, also be a psychologist and a teacher. Georgiy Oganesyants has fully mastered this art.

Communications sessions during his shift are distinguished by a lively and relaxed atmosphere. Sometimes a flow of dry, routine information passes to the spacecraft: "Switch on Roman 1.... Switch off Boris 3...." When the cap com pauses for breath before giving the next instruction, Oganesyants suddenly comes on the air. After 10 or 15 seconds of conversation the tension, which has not yet come to the surface, is relaxed.

Personal acquaintance with cosmonauts helps Georgiy Sarkisovich sense the situation. He knows each one of them well and has taken part time and again in their training and drill sessions and in the work of the examining board which determined their readiness for the mission. He is respected by the cosmonauts. When he comes on the air, Oganesyants does not need to identify himself -- they immediately recognize his voice. Valeriy Ryumin, for example, who holds the world record for duration of stay on board a space station, would converse with him from orbit with the following combination friendly and respectful form of address: "Georgiy Sarkisych." And Ryumin cannot be accused of a lack of businesslike demeanor, and certainly cannot be accused of excessive loquaciousness.

The art of intercommunication is a complex science. And Oganesyants was learning this science. He was learning through his own experience and that of others. And he had plenty of people from whom to take an example. Such as deputy mission controller Viktor Blagov. He possesses a keen sense of his audience and interlocutors, even if they are far away, in earth orbit.

Expertise increased as the years passed. Oganesyants became one of the top shift mission controllers. He would be assigned the most critical phases of manned missions: the first spacewalk taken by Yuriy Romanenko and Georgiy Grechko on the Salyut 6, fuel transfers to the station from the Progress supply craft; the list goes on....

Georgiy Oganesyants is presently in charge of the orbital station management team. This involves a great deal of work: long-term mission program planning, station systems control and management, planning and scheduling of mission scientific experiments and, finally, accomplishment of the scheduled mission program.

Although they remain behind on earth, the specialists at Mission Control Center live and breathe the mission and share with the cosmonauts aloft all

the difficulties of flying the mission. Georgiy Oganesyants is one of them, these terrestrial space workers.



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